

ARCHIVES OF OTOLOGY.

A CONTRIBUTION TO THE SURGERY OF THE TEMPORAL BONE.

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(Continued from p. 12, Vol. XXVIII.)

Sclerosis and Rarefaction of the Temporal Bone are frequent and interesting pathological expressions enacted as results of *known* chronic focal and general lesions of the tympanic cavity and its pneumatic accessories. The varied textural alterations we meet, with the specific morbid changes which cause them and terminate either in increase of solidity or abnormal thinning of different localities, or of the entire temporal bone, can be surmised in part only, before surgical intervention is resorted to. Important knowledge concerning these so often treacherous secondary lesions must therefore remain unknown until this has been undertaken. The demand for such interference is as often one of expediency as of imperative necessity. It is not always to meet sudden and therefore unlooked-for complications, but rather to be ready for those which surgical experience, and pathological studies as well, have taught us we must look upon as being in constant evidence and therefore liable to occur at any time.

The brief recital of surgical experience with this group of cases indicates, imperfectly only, the wide scope of its application. It refers, merely, to the more uncommon clinical expressions of these insidious consequences of chronic middle-ear lesions.

Among these are :—**Excessive and persistent** neuralgia as an attendant of hyperostosis or solidification of the mastoid region ;—**Necrosing** otitis, suddenly and mysteriously

starting in the sclerosed or rarefied areas of the bone; —Gradual absorption, but not necessarily erosion, of the tympanic attic and antrum, as a result of low inflammatory activity, accompanied by the slow but **uninterrupted choking up with cholesteatomatous masses of these already abnormally dilated cavities.**

In a certain number of latent chronic pyogenic lesions of the tympanic cavity common surgical experience refers to and upholds a probable causal relationship between hyperostosis of the mastoid region with partial or complete obliteration of the air-cells and intense and prolonged neuralgic suffering.

A smaller contingent of cases has been referred to before, which also belong unmistakably to this category, in which, however, every tangible evidence of a middle-ear lesion was absent at the time of or antedating these violent outbursts of suffering, vide p. 480, volume xxvii.

The point of interest is not the occurrence of hyperostosis, for that is admitted and established as a not infrequent final expression of certain purulent lesions of the tympanic cavity, of low grade, of interminable duration, characterized furthermore by wholly latent clinical evidences. Whether we can, however, assume a causal relationship between the sudden and violent outbursts of neuralgic suffering and the bone solidification which is in progress, remains, even with these cases, an open question. The paroxysms of suffering come about without assignable cause and without warning and resist every other method of treatment except surgery. They are unattended by fever or other constitutional disturbance except that which results from prolonged, unrelieved suffering. There is absence of redness and swelling of the mastoid region. The most careful examination of the original or existing middle-ear lesion fails to disclose any change either in the character of the discharge, its quantity, or in the pathological changes of the tympanic cavity, ossicles, or antrum which are present and are known to have been present for a long time.

A strong neurotic element is almost without exception in evidence in these cases but is often entirely overlooked.

The presence of a foetid discharge associated with an old middle-ear lesion and the ever-present menace of grave infective brain disease in all such cases, is in these instances likewise wrongly interpreted and may lead to an erroneous diagnosis because of the excessive pain and prostration, and to an expression of opinion of unnecessary gravity of that particular case. Surgical measures when resorted to, fail to reveal an implication of the brain or its coverings or even a sudden destructive advance of the middle-ear lesion. Empyema of the cells and antrum is also found to be absent. The only discovery which forces itself upon the attention of the surgeon in such cases is the abnormally thick, brittle, and hard texture of the bone in the mastoid region with partial and, in not a few cases, total obliteration of the numerous cells of this locality.

The questions which arise are: Is the excessive suffering in cases belonging to this group explained by the hyperostosis which is often found, the presence of which was surmised before an operation was undertaken for the relief of different indications, but in which the principal object was to bring about the cessation of intense suffering which had resisted all other measures? Does the hyperostosis which is present compress sensory nerve filaments gradually or suddenly, in their passage through the sclerosed bone? Are some localities of the mastoid or other regions of the temporal bone more prone to manifest these excessive and inveterate outbursts because of the passage of important nerve trunks? Can we adopt the same explanation, that of a gradual or sudden compression of sensory nerve filaments also for those cases in neurotic or hysterical subjects in which no middle-ear lesion is present either before or at the time of the violent paroxysms? Nevertheless in just such cases sclerosis or rarefaction of the bone is sometimes found after an empirical measure to relieve a supposed inflammatory lesion which is not present; while instead, the markings of a remote pathological process are disclosed. In a smaller number again even these must be excluded and the sclerosis or rarefaction must be considered an individual peculiarity. Assuming that in these cases with a

dominant neurotic element, abnormal sclerosis of the bone is found, the point is, may we not conclude that the pain is due to mysterious impulses through the sympathetic channels and their known structural connection with the otic branches of the trigeminus? On the other hand we cannot overlook another fact, that the pain in these cases may result from a perversion of function or physiological purpose of the pneumatic spaces of the bone.

A necessary sequence of these sclerotic changes is the obliteration of the air cavities and atrophy of their lining membrane, with compression of larger nerve trunks, resulting in explosive irritation in their peripheric termination. But even though this is a speculative assumption and awaits further corroboration, *it must be admitted that sclerosis of the mastoid region of the temporal bone, occurring as the result of chronic purulent intratympanic lesions, is a frequent cause of excessive and inveterate suffering.*

The following brief account of a typical case refers to the more important clinical features.

CASE 16.—Hyperostosis (general) of temporal bone; chronic intratympanic suppuration; excessive neuralgia. Schwartz-Stacke operation. Recovery.

Mrs. McK., æt. forty-nine, Cincinnati, had had for many years chronic suppuration of the left ear. The discharge was fœtid but not profuse. It was not annoying because of the stringent cleanliness practised. There had been no perceptible increase either in quantity or character of the discharge for years. During the last six years her general health was undermined by repeated illness and nervous shock following oöphorectomy which became necessary for the relief of agonizing reflex neuralgia. About this time she began to suffer from pain in and around the left ear, but assigned this to the ovarian trouble. After the operation there was a cessation of the intense vertex headache, but the pain in the region of the left temporal bone, localized behind the auricle, became more frequent and inveterate. Her physician, during one of these violent neuralgic seizures, supposed that the old middle-ear trouble was responsible for the pain and resorted to a curettage of the middle ear. It was followed by facial paralysis. After this, without fever or other constitutional disturbance, swelling or œdema over the mastoid region, the attack persisted with increasing intensity.

After uninterrupted suffering for five days the patient was referred to me for consultation. There was no fever, swelling, or œdema, but intense unremitting pain was referred to the region of the left temporal bone and the deeper recesses of the ear. The osseous portion of the meatus was dilated, the drum and ossicles almost entirely destroyed; some discharge was present. An exploratory operation was at once advised and consented to. It disclosed extensive hyperostosis of the mastoid region with complete obliteration of the air cells and a contracted antrum. Suspecting recurring disease of the walls and tegmen of the tympanic cavity or the presence of necrosed ossicles, the middle ear was completely exposed. The same compensatory bone hypertrophy was here present also. The bone was hard and brittle and not vascular except near the external confines of the sclerosed region. The operation relieved the intense pain, and three years have elapsed without recurrence.

The recital of two similar cases is omitted because they resemble so closely the clinical aspects of this case, and exploratory surgery furnished similar findings, *i. e.*, extensive bone sclerosis with compensatory thickening of the walls of the antrum, roof of the tympanic cavity, and obliteration of the cells, but without a sudden, active participation or aggravation of the original tympanic suppuration.

Taking up, next, the disclosures of surgery in those cases in which a necrosing otitis is discovered within a sclerotic area of bone, violent and persistent neuralgic pain being one of its most conspicuous attendants, we are furnished with a more tangible proof of the cause.

It would appear that in these cases the bone hypertrophy, especially of the mastoid region, encroaches steadily upon the adjacent regions, and there excites trophic disturbances which result in a localized necrosing otitis. *The primary, chronic, middle-ear lesion may not in any way change its character either in the quality or quantity of the discharge, or in a more active participation of the lesion of the bony walls or ossicles, and this in the few cases under my observation was found.* It is evident, also, from these observations, *that the anterior wall of the epitympanic cavity and roof of the auditory canal are the localities most prone to be invaded by this variety of necrosing otitis.*

It must also be added that, owing to the slow and insidious progress of this uncommon complication, positive clinical attendants are absent. A latent course is in these cases the rule, and for this reason swelling and other attendants are absent. Pain may be a prominent symptom, and not infrequently hemorrhage, due to erosion of branches of the mastoid veins. This is especially apt to occur if the necrosing otitis encroaches upon the posterior wall of the auditory canal. If the subject belongs to the neurotic type, it is the more to be looked for, and may resist every treatment.

CASE 17.—Necrosing otitis of the anterior wall of the tympanic cavity; persistent neuralgia; vertigo; sclerosis of mastoid region. Stacke's operation. Recovery.

Mention is made of this case, a typical one of its kind, in which the degree of suffering was out of proportion to the pathological changes present. The most persistent vertigo was suffered for months at a time, with utter helplessness in consequence of the dread of its recurrence. It was also the only case under my observation in which the indication for the operation proposed by Stacke was clearly present and the operation practised strictly in accordance with his suggestion.

Mrs. J. J., æt. thirty-eight, Shelbyville, Indiana. Since childhood has had suppuration of left ear. Her general health had steadily declined during the last eight years, and persistent vertigo with neuralgic seizures which she always connected with her old ear trouble were frequent and of long duration. Every method of treatment, general and local, had been tried, only to be abandoned as insufficient.

The examination of the ear showed a meatus of wide lumen, conclusively suggesting a former destructive otitis, with disappearance of the annulus tympanicus and complete destruction of the drum and ossicles. What remained of the latter were probably firmly impacted in the epitympanic cavity. The posterior wall of the middle ear was granular, but no bone erosion could be discovered. There was no tenderness of the mastoid, except during periods of pain, nor had swelling or redness been noticed. The discharge was about as it had been for years. Syringing was impossible; even inclining the head forward or to the left side caused vertigo. She was emaciated and anæmic, and in a

pitiful state mentally in consequence of the persistent suffering and dread of attacks of vertigo.

The operation disclosed a hard, sclerosed anterior wall of the tympanic cavity and antrum, with sequestered portion of the hammer and anvil wedged in the epitympanic cavity. The bone was so hard, and in texture like ivory, that only small portions could be removed, and the operation was very tedious. After thorough exposure of the epitympanic cavity and antrum and curettage of posterior wall of the tympanic cavity, the mastoid process was opened. It was found solid. This established, no further interference was resorted to in this region.

The subsequent progress of this case was favorable, and the patient was completely relieved of vertigo which had persisted for years and the pain which had defied the skill of aurists and general practitioners.

With experience gained since then, I would invariably practise ablation of the sclerosed cortex and body of the solidified mastoid region in similar cases. The result in this case was favorable, but in the following case was not, and a subsequent operation was necessary.

The indications for the Stacke operation, as recognized also by him, have a very limited application, and in such and similar cases it would certainly be advisable to ablate the sclerosed mastoid region first, and, subsequently, the anterior wall of the middle ear and antrum—in other words, resorting to the radical operation after the Schwartze-Stacke method.

The brief history of another case, in which pain was a conspicuous and inveterate symptom, to which was added another less common, *i. e.*, persistent hemorrhage from the external meatus, resulting in such loss of blood that in consequence a more rapid decline in strength came about.

CASE 18.—Hyperostosis of mastoid; necrosing otitis; excessive neuralgic seizures. Two operations. Recovery.

Mrs. B., æt. thirty-four, Richmond, Ind., a fairly well developed woman with unmistakable evidences of former strumous disease of the glands of the neck, as evidenced by extensive cicatricial tracts and scars. Her ear trouble dates to early girlhood, during which she had other pronounced scrofulous manifestations. The left ear auricle and meatus are exquisitely sensitive at all times.

Even the ordinary inspection with speculum called forth complaints of its discomfort. The meatus was not contracted, but large. The region of the annulus tympanicus was thickened and the drum cavity so altered that a satisfactory inspection was not possible. In the posterior and upper wall of the osseous canal, the probe came in contact with denuded bone, and this was the region which it was stated was so painful during the cleansing of the ear with cotton, and from which hemorrhage occurred almost daily, often several times a day, and at night necessitated firm packing with styptic cotton. The blood was dark in color. At first it was assumed that it emanated from a tuft of granulation tissue around the outlet of a fistulous sinus in the bone, but this view had to be abandoned for this could not be discovered. A split or cleavage of the bone had taken place, and from this the hemorrhage proceeded. The discharge was foetid and thick, but not profuse. Tubercle bacilli were not found. No fever or active inflammatory symptoms were present. Pain almost persistent, breaking into more violent seizures at short intervals, and the annoying hemorrhage led her to submit at once to radical surgical measures. The operation brought interesting disclosures. Bone sclerosis in consequence of the long existing intratympanic suppuration was general. The mastoid region, especially, was solidified completely. An anomalous course of the sinus led to its exposure during the beginning of the operation. Owing to its course close to the posterior wall, the operation was modified and the method of Küster was substituted for the opening of the mastoid (Schwartz). The posterior wall was removed and the entire region exposed for inspection, followed by removal of ossicles and thorough curetting when this was necessary. The deeper recesses of the bone adjacent to the antrum and middle ear were especially thickened and hardened. In the bony meatus and extending into the roof of the tympanic cavity and forwards and upwards along the canal was a denuded necrotic area in the sclerosed bone. The subsequent course after the operation was favorable so far as the healing of the wound was concerned, but almost from the first complaints of excessive neuralgic pain with exquisite tenderness of the surface region behind and around the auricle were made. It was inferred that the sclerotic changes of the tip of the mastoid which had not been interfered with might account for the return of suffering referred to in this region, for there was absence of

every evidence pointing to an intracranial or infectious complications; a second operation was performed. The extreme tip and the adjacent region were found completely solidified and the texture brittle. Almost fourteen months have passed and the pain has not returned. There is present, however, still some discharge but not offensive. The probe readily discovers denuded bone which has not been covered by cicatrizing granulating tissue.

In this case also a neurotic element was in dominant evidence. It is probable that the anxiety and mental concentration after the first operation, because relief from neuralgia was not forthcoming at once, may have precipitated an attack such as we have not infrequent opportunities of observing among hysterical subjects.

In referring to another group of cases in which surgical experience discloses what was surmised, *i. e.*, *rarefaction of different localities of the bone, but in particular of the walls of the mastoid antrum and tegmen tympani, we often meet with unlooked-for revelations.* This is not always due to erosion. In some cases it is simply an absorption of the walls and dilatation of the cavities in consequence of pressure from the filling up and *complete choking with cholesteatomatous masses, the result of wholly latent grades of low inflammatory activity.*

The gradual and ceaseless growth of these dermoid products with caseated and inspissated pus, is, wherever and whenever it is found, a grave menace to the resistance of the osseous walls of these cavities, into which they have been transplanted. These spaces become retention cavities, and a yielding of the walls, even if compensatory hypertrophy may have preceded it, is inevitable. The most treacherous cases of intratympanic suppuration are those in which the destructive activity is, neither at first or throughout its long course, complete, and in which the drum is only in part destroyed and the ossicles ulcerated only, but not sequestered. The principal, often the only complaints, are the increasing deafness and a foetid otorrhœa.

CASE 19.—Chronic intratympanic suppuration of both ears; ingrowth of secondary cholesteatomatous products of mastoid antrum

and tympanic cavity. Double Schwartz-Stacke operations. Recovery.

The patient, Miss M., of Jackson, O., æt. twenty-nine, was a frail and delicate woman. The family history and her appearance suggested a tuberculous trouble. She was emaciated, and had persistent cough and fever. Physical examination of the chest, made by her family physician and a specialist, failed to confirm this inference.

Examination of the discharge from the ear also failed in the discovery of tubercle bacilli. The deafness, which had been pronounced for years, steadily increased, and at the time of her first visit to me she could only hear loud conversation when spoken directly into the ear. The discharge, which had never been copious, was offensive. In both ears extensive destruction of the drum and ossicles had taken place, and the tympanic cavity was filled with cholesteatomatous masses. The radical mastoid operation, to expose and clear the epitympanic and adjacent cavities and to meet other needs which an operation alone could disclose, was proposed and practised.

It was found that sclerosis of the mastoid region had taken place, and all except the posterior pneumatic cells had disappeared; that the antrum was much dilated and packed with the masses mentioned. The tympanic cavity was exposed for inspection, followed by removal of the ossicles and masses of firmly packed layers of cholesteatomatous products. Recovery was uneventful, and the restoration of hearing was an agreeable surprise. She was, before the operation, helpless, in consequence of the deafness; afterwards she could hear ordinary conversation at a distance of four feet. The right ear was, after an interval of several months, treated by the same Schwartz-Stacke method, but restoration of hearing was not achieved. The patient has gained in health and strength.

In another case a more striking illustration of the treacherous course was observed.

CASE 20.—Secondary cholesteatoma; extensive erosion of tympanic attic and antrum; erosion of sigmoid groove and exposure of sinus. Operation (Schwartz-Stacke). Recovery.

M. M., æt. thirty-four, Cincinnati, has been under my observation for ten or twelve years. She had a fœtid otorrhœa from the left ear, but never any pronounced complications of the bone or

periosteum ; finally vertigo so persistent and annoying that she was rendered helpless in consequence, and only after these symptoms were added did she consent to an operation. The Schwartze-Stacke, or radical mastoid, operation was performed. Dense sclerosis of the cortex was disclosed, with here and there only, a contracted pneumatic cell, with leaden-colored lining membrane. The antrum was packed with cholesteatomatous masses, absorption of the tegmen and exposure of the dura had occurred, but there was no epidural accumulation of pus. The roof of the tympanic cavity was also eroded and the dura exposed. The anterior wall of the epitympanic cavity was found abnormally thickened. After the removal of ossicles and cholesteatomatous masses, the epitympanic cavity was found much dilated and, as already stated, the tegmen tympani was gone and the dura exposed. The entire region was exposed for thorough inspection and for the most complete removal of the pathological products within the cavities, and for surgical treatment of the walls. The sinus was laid bare for inspection, but it was intact. Permanent facial paralysis followed the operation. This was not surprising, as the entire posterior wall of the middle ear was eroded. Aside from this, recovery, though tedious, was favorable, with complete cessation of vertigo.

As surgical experience adds to our knowledge of these treacherous complications of chronic intratympanic suppuration, it will enable us to assume with more reasonable certainty, at a much earlier stage, the presence of bone sclerosis or rarefaction, or both, in a larger number of cases belonging to this group. In just this class of cases there is a wide field for exploratory surgery, if discriminately selected. This will at once direct measures which, if practised with thoroughness, are certain to avert lurking dangers which will otherwise inevitably follow.



EXTENSIVE LACERATION OF THE AURICLE AND
COMPLETE SECTION OF THE EXTERNAL AU-
DITORY CANAL, WITH PARTIAL DETACHMENT
OF THE STERNO-CLEIDO-MASTOIDEUS TENDON
AND SPLINTERING OF THE TIP OF THE MAS-
TOID, BY A BLOW FROM A BRICK—OPERATION
FOR RESTORATION OF THE AURICLE AND
CANAL.

BY SWAN M. BURNETT, M.D., PH.D., WASHINGTON, D. C.

(With 1 figure in the text and Figure 2 on Text-plate I.)

I NJURIES to the auricle are very infrequent as compared with injuries about the other parts of the head and face. At the Emergency Hospital, Washington, where, on an average, 1500 wounds and injuries of all kinds to the head and face are treated annually, it is rare that an injury of any sort to the auricle is recorded. The clientele of the institution being recruited largely from the colored population, occasional cases of biting or "chewing" of the auricle are met with, but frequently a whole year passes without the record of a single incised wound of the auricle being made. This seems remarkable considering the prominence of the ears on either side of the head, equally prominent with the nose, and yet among these 1500 cases there is an annual average of 18 cases of fracture of the nose recorded. The disproportion is no doubt due, in some measure, to the fact that in falling or fighting the face is more commonly towards the point of danger, and in some measure to the elasticity of the auricle. We find the same infrequency of injuries to the auricle in the reports of special institutions. Thus taking

the last annual reports (1898) of the Manhattan Eye and Ear Hospital, of the Massachusetts Charitable Eye and Ear Infirmary, the Brooklyn Eye and Ear Hospital, and the New York Ophthalmic and Aural Institute, aggregating 13,565 ear cases, there are but 7 cases of wounds or injuries to the auricle tabulated, and no operation for injured auricles is mentioned. Formerly, when the sword and sabre were in common use in warfare and personal encounters, cuts of the auricle, or its entire removal from the head, were not uncommonly met with, and the duelling custom in the German universities has led to many incised wounds of the organ. With our more modern methods of conducting war, however, the auricle has almost entirely escaped, though Sexton has found among the records of the civil war 7 instances in which the auricle was cut off by large projectiles, and two cases of great mutilation of the auricle by musket-balls. He also saw, during his service in the war, a few sabre wounds of the auricle. He likewise records some cases of arrow wounds of the auricle.

As a rule, our standard text-books give but scant consideration to wounds of the auricle and external auditory canal, and that usually at second hand. Moreover, very little is said in a definite way about operations for restoration of the external auditory canal after its section by traumatism.

The conservative treatment of all injuries to the external auditory meatus must hold as its cardinal feature the preservation of the lumen of the canal. If this is not adhered to, though the operation may be surgically a perfect success, it is functionally an utter failure.

In this connection I consider the following case worthy of being placed upon record:

Mr. D. A. S., aged sixty-three, was struck, on the 9th of August, 1898, on the right side of the head by a brick thrown by a negro man with whom he had some misunderstanding. He was knocked down by the force of the blow but did not lose consciousness, though badly stunned.

He was carried to the Emergency Hospital and I saw him at 12.30 P. M. I found the auricle completely divided into three distinct parts, separated by large gaping wounds. The principal

wound ran obliquely from above forwards, downwards and backwards; starting one and a half inches in front of the tragus, passing just above the tragus across the meatus auditorius externus, and the antitragus, and terminating at the tip of the mastoid. The other wound passed upward and backward from this, beginning at the position of the meatus externus and extending entirely through the auricle and denuding the cartilage of the central piece of its integument on its outer half. The bottom of these wounds was formed by the denuded bone. The external auditory canal was represented only by a small round hole in the depth of the wound. It had been completely severed at the junction of the cartilaginous with the integumentary portion. Figure 1 gives a good idea of the condition. Unfortunately, the photographer to the Lionel Laboratory was absent, and no photograph could be taken. This drawing was made from sketches taken at the time. A closer examination revealed a severance of the sterno-cleido-mastoid from its attachment to the tip of the mastoid for at least one half of its extent, and an extensive shattering of the bone, several large pieces of which were adherent to the tendon of the muscle and retracted by it deeply into the cavity of the wound. The whole of the mastoid at this place was laid bare, as was also the bony wall of the external auditory canal and the adjacent parts.

The patient was put under the influence of an anæsthetic. It was first necessary to free the mastoid tip and the tendon of the sterno-cleido-mastoideus from the bone splinters. This was found to be no easy matter, for the bone was so strongly adherent to the tendon as to necessitate the cutting off of a portion of the tendon with the splinters attached. The next endeavor was to reconstruct the external auditory canal. No semblance of the cartilaginous portion of the canal was left, and it only remained to fashion one from the tissues of the widely separated parts with but little to guide as to the former normal relations. By patient trying, however, it was possible to bring the upper portion of the wall, which was least dislocated, into line, and by a very small and very sharply curved needle it was sutured to the remaining portion of the canal. Having now obtained a *point d'appui*, the middle fragment was fitted to this and another suture introduced, fastening it also. The lower fragment was now brought up into place. The difficulties of suturing this were the greatest of all on account of the narrowing of the space caused by the other sutures

and the greater raggedness of the wound's edge. The suture, however, was finally applied and the canal restored with approximately its normal lumen. Two sutures united the wound in front of the auricle. The fragments of the auricle were then brought together by a sufficient number of sutures through the skin, the large flap of integument which had been torn from the anterior surface of the middle fragment, and which hung over the back of the cartilage, being brought over and fitted into place.



The wound over the mastoid was closed after having been packed with iodoform gauze, leaving a drainage space at its lowest part. The re-formed auditory canal was filled with a roll of iodoform gauze. The restored auricle was supported carefully on pads of sterilized gauze and the whole covered with a light bandage.

It was feared that the effect of so serious a blow might not have been limited to the mastoid, but have extended to the base of the skull, and for this reason the patient was to be carefully watched. There was no notable rise in the temperature, however, nor any other untoward symptom, and on the fourth day, when the dress-

ings were removed for the first time, no pus was found. The hearing on that side was not abolished, though less acute than in the other, showing no injury to the nervous apparatus.

The rest of the history is short. It followed the usual course of injuries to the bones and soft parts in a person of his age. There was a slow filling up of the cavity over the tip of the mastoid, and a fistula which extended over the denuded bone from this to the sutures in the lower part of the re-formed auditory canal. This, however, healed with no suppuration, except for a brief interval, due to an accidental infection, and which was stopped by strong solutions of nitrate of silver. At the end of two months the cure was complete, with a lumen of the canal but little less than that of its fellow. The condition of the auricle is shown in the accompanying figure (2) made from a photograph taken at the time. His hearing for the watch is about the same on each side, namely, six inches, but his hearing for the voice is better and more distinct on the injured side. The vertex T.-f. is heard loudest in the right, the injured, ear.



FIG. 2

Case of Extensive Laceration of Auricle, etc. Result after Operation.



FIG. 3

Case of Sarcoma of the Frontal and Ethmoidal Sinuses.

SARCOMA OF THE FRONTAL AND ETHMOIDAL SINUSES.

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(With Figure 3 on Text-plate I.)

SARCOMATA of the accessory sinuses, while not among the extreme varieties, are yet sufficiently uncommon to warrant the publication of another case as a contribution to the more complete study of the disease.

Mr. L. S., aged fifty-seven, a rather vigorous-looking veteran of the civil war, consulted me on the 27th of April, 1897, on account of a swelling at the upper-inner angle of the right orbit, which he had first noticed as a small lump about the middle of the previous February. The swelling, which had gradually increased in size, had not been attended with any considerable amount of pain, though it was somewhat sensitive to pressure. The tumor had now attained to such a size that its apex extended one centimetre beyond the bridge of the nose, and it was encroaching on the forehead above and extended laterally to near the centre of the orbital arch. The upper lid was œdematous and hung down over the eye, covering the pupil most of the time. The eyeball itself was displaced downward and outward but not noticeably forward, and its movements were restricted. There was a diplopia when the pupil was uncovered corresponding to this displacement. The diplopia had first come to his attention on the 25th of last March. Vision in this eye $\frac{5}{20}$; in the left $\frac{5}{10}$. There was no deficiency noted in the visual field of the affected eye. The fundus of the eye was not different from that of the unaffected eye. Some weeks previously Dr. C. R. Dufour had removed some polypi from the right nostril which, on microscopic examination, were

found to be of the ordinary mucous variety and contained no sarcoma cells. There had been no injury to that region, and the trouble in the nose was the only antecedent history of disease, and how long this had existed could not be definitely ascertained. He slept and ate well. A more careful examination of the tumor showed it to be rather soft, and about one centimetre above the orbital edge, and at this same distance to the right of the medial line the rough edge of a deficiency in the frontal bone was felt.

Operative interference having been decided upon, he was sent to Providence Hospital, and on the 30th of April, under ether, an incision was made horizontally across the tumor just under the brow. No pus or other fluid escaped, but there was immediately exposed a mass of soft but fairly consistent reddish material which was easily broken down by a spoon or the finger nail. This was removed, first with a sharp spoon, and later, as the depth of the cavity was reached, by means of the little-finger nail of the right hand, this being considered safer than any insensitive instrument. A very large cavity was thus revealed, involving the frontal sinus of the right side, very much distended, and extending through the septum to the left sinus. Backward it invaded the ethmoid, the entrance to which was marked by a ragged opening in the bone a centimetre or more in diameter. The little finger extended in these explorations beyond the second joint. There was an almost circular deficiency in the outer layer of the frontal bone, a centimetre in diameter at about that distance above the edge of the main opening; the bone between the two openings, being loose, was removed. No opening was found in the walls of the orbit. The diseased tissue was removed carefully, everywhere going down till bare bone was reached, the operation requiring an hour. The cavity was then thoroughly washed out with boiling water, and afterwards packed with iodoform gauze. May 1st; rested well and feels comfortable. Blood and mucus came from the left nostril, none from right. May 2d; dressing removed and cavity repacked with iodoform gauze. Temp. normal. May 3d; temp. 101° last night, but fell to $97\frac{1}{2}^{\circ}$ this morning. May 4th; temp. normal. From this time on the general condition of the patient was fairly satisfactory, though the local disease showed no signs of improvement. The cavity soon began to refill, and on June 8th was as is shown in the figure, which was about the appearance at the time of the operation.

An examination of the tissue removed, made at the Lionel

Laboratory of the Emergency Hospital, having shown that it was a round-celled sarcoma with rather more than usual vascularization, it was decided unwise to attempt any further operative interference. He left the city on June 30th, and I did not see him again.

The further history is contained in the following extract from a letter received from Dr. Wm. L. Schutter of Albany, N. Y., under whose care he was at the time of his death.

"After he left Washington the disease followed the usual course, breaking down and discharging continuously with consequent emaciation and weakness until August 16, 1897, when he had nine convulsive seizures. On the 18th he had three more, and after that lapsed into a torpid condition, which was followed by a comatose state, and finally by death on September 8, 1897."

No autopsy was obtained.

FRACTURE OF MALLEUS AND ANNULUS TYMPANICUS.

By FRANK ALLPORT, M.D., CHICAGO, ILL.

THE report of Pritchard, in *Kings College Hospital Reports*, for 1897, of a case of fracture of the handle of the malleus, due to indirect violence, leads me to report a similar instance occurring under my own observation.

Mr. S., age about forty, thrown from carriage, followed by prolonged unconsciousness and aural and nasal hemorrhage. Quickly seen by family physician, Dr. F., who cared for patient generally. He observed rupture of left drum membrane, and treated ear on strictly antiseptic principles, with the result of a speedy closure of the wound. I saw the case, perhaps two weeks after the accident. Patient somewhat dizzy and pale. Watch not heard on contact, but hears moderately high and loud voice. Tinnitus and muffled sensation in left ear. Eustachian tube open. Drum membrane congested and retracted. Handle of malleus fractured. Line of fracture plainly seen. Fractured end displaced inward. Upper and posterior portion of annulus tympanicus also fractured, as seen and felt by sharp line of disunion. Treatment has been, frequent middle-ear inflation, and suction by Siegle's otoscope. Result, good, six months after accident. Fracture lines still visible. Drumhead occasionally congested. Watch 20-24. Whisper, 30 feet. Occasionally muffled and stuffy feeling in ear.

THE OPERATION FOR OTITIC BRAIN-ABSCESS WITH SPECIAL REFERENCE TO ITS CURA- TIVE VALUE.

BY DR. F. RÖPKE, SOLINGEN.

Abridged and Translated by Dr. ARNOLD H. KNAPP, New York.

THOUGH scarcely any difference of opinion on the indications and methods of operating for otitic brain-abscess exists at the present time, the true curative value of the operation is not universally accepted. The possibility and justification for the operation of an otitic brain-abscess was established by the publication of successful cases at about the same time by both German and English surgeons. The difficulty, and in fact the occasional impossibility of a correct diagnosis became more and more apparent in subsequent years. The question, when should we and when may we trephine in search of a presumable abscess was not clearly answered for a number of years. The first operations for otitic brain-abscess in 1886 were undertaken from the appearance of general symptoms of brain irritation. Bergmann, three years later, restricted the indications for operation to cases where distinct focal symptoms were present. A great step in advance was made by the discoveries of McBride,¹ and Körner.²

¹ MCBRIDE and MILLER: "The Diagnosis and Treatment of Cerebral Abscess Due to Ear Disease." *Edinburgh Med. Journal*, vol. xxxii., pt. I, 1887.

² KÖRNER: "Statistical Contribution on the Otitic Brain-Abscess." *Arch. f. Ohrenhkk.*, vol. xxix., 1889.

Among the many excellent publications on this subject the following two deserve the first mention:

MACEWEN: *The Pyogenic Infective Diseases of the Brain and Spinal Cord*. Macmillan & Co., 1893.

KÖRNER: *Die Otitischen Erkrankungen des Hirns*, etc., 2d edition. J. Alt, Frankfurt-a-M., 1886.

McBride made the statement that most temporo-sphenoidal abscesses were situated directly over the tegmen tympani. Körner advanced the same thesis and added the important statement that the majority of cerebral abscesses stood in direct communication with the primary diseased focus. Thus the indications for the operation of cerebral abscess were greatly broadened. Körner mentions in this publication that the uncertain opening of the skull over the supposedly diseased part of the brain should be replaced by the systematic search for pus in the brain by the same way as the morbid process extends from the affected ear and temporal bone to the brain.

At present it is generally believed that the otitic brain-abscess runs an acute or subacute course. Macewen found that the otitic brain-abscess runs a more rapid course than the traumatic, and Oppenheim concludes from a study of the cases that only a small part of the otitic brain-abscesses are to be classed as chronic.

The rapidly increasing number of observations on this subject show that the otitic brain-abscess runs a rapid course and develops in a comparatively quick time from the beginning of the ear disease. Our list of operative cases shows that 26 cerebral abscesses followed acute otitis, while 109 followed the chronic otitides.

According to our statistics cerebral abscess occurs in the following decades of life :

0-10 years, 24.
11-20 years, 33.
21-30 years, 36.
Over 30 years, 30.

Thus the greatest frequency is found in the second and third decades.

As regards the sex, 83 males and 41 females were affected.

The abscesses occurred 66 times on the right side, and 67 times on the left.

If signs of brain compression are added to an otorrhœa with symptoms of brain irritation, the diagnosis of brain abscess is assured. Several authors have shown that aside

from brain tumors developing in cases of otorrhœa, focal symptoms may appear in other intracranial suppurations. Moos found aphasia in a tubercular meningitis of the convexity; Jansen found optical aphasia in a circumscribed inflammation of the meninges and cortex at the lower surface of the left temporal lobe; Salzer, Pritchard, and Macewen noted disturbances of speech in epidural or subdural abscesses, and Salzer anæsthesia and muscular contractions in the opposite half of the body. These cases are, however, infrequent, for Grunert did not find in twenty cases of extradural abscess a single case of crossed paralysis, disturbance of sensibility, or aphasia. In general we may safely open the cranial cavity after the mastoid operation, and puncture the brain, in cases where symptoms pointing to a focus in the temporal lobe exist with otorrhœa.

In cases where a brain abscess is suspected, though focal symptoms are not present, operative interference will depend on the severity of the symptoms. A patient in coma with any suspicion of a brain abscess would of course be immediately operated on and the brain incised. In cases where the symptoms point to a very rapid course of an intracranial suppuration, we must trephine immediately for fear of the rupture of the rapidly growing abscess into the ventricles or meninges. Moreover, the primary ear-trouble must not be neglected.

In those cases where the disease is more latent, a radical tympano-mastoid operation may first be done; the further steps depend upon the findings at the operation. Caries, fistula, or defects in the bony roof of the tympanum would naturally call for a free opening into the middle cranial fossa and a search for extradural or intracerebral suppuration. If the morbid process does not extend to the dura, the result of the radical operation can be waited for, as it is not unusual to see general brain symptoms without intracranial suppurations. If, after the exposure of the middle-ear cavities, irritative brain symptoms continue, we must open the middle or the posterior cranial fossa; if the extradural condition is negative, we may again wait for results before investigating the brain. Such general rules are, how-

ever, not applicable to all cases, and everyone will encounter cases where he is entirely at a loss.

Methods of Operating.

Macewen, in 1881, was the first to operate for and evacuate cerebral abscess after ear disease, from the brain symptoms and without the guidance of an external fistula. Subsequently other abscesses were operated on from the squama, until the year 1889, when Küster's publication of the radical operation of the middle-ear cavities, so closely connected with the operation for brain abscess, appeared. Körner in the same year recommended the systematic search for brain abscesses in connection with the radical operation, by attacking the base of the temporal lobe through the tegmen tympani. This method was carried out successfully by Schede in 1891. Macewen had made a counter-opening through the tegmen tympani, for drainage, four years previously. Quite a large number of authors have opened the abscess from the tegmen, some independent of Körner, others following his views. Some do not recommend this method for all cases. Schwartze thinks it rational only when fistulæ pass directly into the cranial cavity. Macewen confines himself to no single method, but operates from the tegmen or the squama, or combines them both.

On the whole, 81 abscesses were evacuated from the squama, 43 from the tegmen tympani; in 7, two openings were made, and in 6 cases fistulæ were present in the squama.

Kretschmann believes the opening of the abscess from the tegmen tympani to have the following advantages: 1. The operation is but an extension of the usual radical operation. 2. The abscess is opened at its deepest part and drainage is best. 3. Large branches of the meningeal artery are not encountered. 4. The operation leads with considerable certainty to the abscess. 5. After healing no protection is required because of the hidden position of the bony defect. Körner thinks that an additional advantage is that the danger of an arachnitis is lessened as the meninges and brain are frequently adherent round about the diseased

bone. On the other hand, Schwartze and others believe that this method is not admissible in cases of uncertain diagnosis and absence of caries or of fistula in the roof of the middle ear, because in cases of mistaken diagnosis an infection is too liable from the proximity of the primary focus. I also think that the danger of infection is very great in such cases, and that the trephine opening in the squama is a much safer procedure. If then an abscess is found, a counter-opening through the tegmen tympani should be made. In abscesses which are evacuated through the tegmen tympani, a counter-opening through the squama should be made, if from the history or the findings at the operation a very virulent infective process is supposed to be present. The counter-opening can also be made later if difficulties from pus-retention, etc., should arise during the after-treatment. As will be seen later, excellent results have been obtained by this double opening of the abscess cavity.

The technique of the operation for brain abscess is comparatively simple. For those acquainted with the performance of the radical operation, the opening of the cranial cavity and an abscess does not present any particular difficulty. German surgeons employ the hammer and chisel in exposing the middle-ear spaces, but Macewen prefers the rotary burr. I cannot agree to the advantages claimed for the burr. Concussion, fissures in the tegmen tympani, or perforation of an abscess into the ventricles or meninges are surely exceeding rare if a sharp chisel is employed. For exposing the dura, the chisel is also the most practical instrument. A bone forceps can then be used to enlarge the opening. The chisel and hammer are also superior to the trephine, as the opening can be made of any size, which is of especial value when an extradural abscess or diseased conditions of the dura are encountered. If the dura is diseased (discoloration, granulations, purulent deposits), it is exposed until healthy dura is seen on all sides. The dura is then cleared of pus or granulations, and fistulæ, especially over the tegmen tympani, must be searched for. If a fistula is present in the dura it will lead to the possibly existing abscess, and the pus can be evacuated by dilating the fistu-

lous tract. The danger of an arachnitis is excluded on account of the surrounding adhesions. When no fistula exists, and it is desirable to explore the brain, puncture through the dura is unsuitable, as it does not permit any inspection of the field of operation and may lead to errors in diagnosis, and if the dura is diseased infection may be carried on. Most authors then incise the dura and examine the subdural space and the brain cortex. This may be done with a crucial incision or a curved incision, permitting the retraction of a flap. Puncture of the brain was at first always done with an aspirating needle or a trocar. Bergmann then recommended the use of the knife, and showed the harmlessness of this procedure. Schwartze, Körner, and others also prefer the knife. Macewen uses a canula with lateral openings.

After retraction of the dura, the site of the puncture may be suggested by the conditions found. It was noticed in some cases that the brain over the abscess bulged outward. If nothing is visible, puncture can be made in the centre of the trephine opening. A number of punctures can be made. In one of my cases I did not evacuate the abscess until on the fifth puncture, and in Stoker's case the attempt did not succeed until the ninth time. The abscess was so exactly localized in only a few cases that the site and direction of puncture were determined from the diagnosis.

Hansberg has experimented how deep we may safely explore the temporal lobe. He says that the smaller the skull the more superficial is the inferior horn, and the greater caution is necessary. In general three centimetres' depth is the limit.

After the abscess has been opened, it should be exposed as fully as possible, to determine its size, contents, and character of lining wall. The head of the patient is turned to facilitate the drainage, and necrotic brain tissue and thickened pus should be removed with gauze swabs. The abscess membrane, if present, should be removed if possible. If this succeeds, the cavity can be lightly packed with gauze; if not, and this is the most usual, the cavity can also be packed with gauze if the walls are smooth, otherwise a drainage tube must be inserted and the wound irrigated.

A counter-opening should be made through the squama or through the tegmen, or it may be sufficient to drain and irrigate the abscess if it has no membrane and the surrounding brain tissue is inflamed. Irrigations are best made with a physiological salt solution, or a two per cent. boric acid solution.

These manipulations must be performed with the greatest caution. The gauze is to be loosely packed, the drainage tubes carefully inserted, and but little pressure used in irrigating. In removing the abscess membrane the instruments must be very carefully handled. We should always bear in mind the proximity of the lateral ventricles to large abscesses; an injury to the ventricle is, of course, dangerous to life.

Macewen employs drainage tubes of decalcified chicken bones; others use tubes of rubber, metal, or glass. It is evident that the openings should be large.

After the abscess has been cleansed, the brain surface, dura, and the wound in the bone must be disinfected. Macewen dusts boracic-acid iodoform powder on the wound surface. Jansen applies a moist boric-acid dressing.

The dressings are to be changed according to the amount of the discharge and the condition of the patient. Gauze packing may remain a week if the patient otherwise does well. If the patient's condition should change for the worse the wound is first to be thoroughly inspected and any retention of pus searched for. A second abscess in the temporal lobe, or disease in the posterior fossa of the skull, must be thought of, if the symptoms should recur. If then, after opening the posterior fossa, no extradural abscess or disease of the sinus is found, another abscess should be looked for in the cerebellum or the cerebrum, according to the symptoms. In case of doubt, it would be best to puncture the walls of the old abscess, as in several autopsies secondary abscesses have been found in the immediate vicinity of the first. Cases have also been described by Manasse, Seligman, and Macewen where a second abscess had perforated the first.

The drainage tube is gradually shortened, and the opening

is kept dilated as long as there is any discharge. Granulations at the opening and at the edges should be removed.

A hernia of the brain may occur after the operation. Any necrosed brain tissue on the prolapse can be removed.

An unfortunate complication is when the cerebral hernia hides the mastoid cavity, as it makes careful after-treatment of the large wound in the bone impossible, and a constant source of infection is kept up.

The patient should be kept in bed until the abscess is closed. The diet should be carefully supervised. Constipation usually persists after the evacuation of the abscess; laxatives can be given after one week.

Can an otitic brain-abscess disappear spontaneously?

The course of an otitic brain-abscess is usually acute or subacute. In many cases the abscess will break into the ventricles or in the meninges after a few days or weeks, and cause death. It is, however, not uncommon that the course is slower and that the growth of the abscess may come to a standstill; then the virulence of the infection is so slight as to permit the formation of a limiting wall. If the brain tissue surrounding the encapsulated abscess is fairly normal, an absorption may take place, though no cases of exactly this character have been observed. The abscess membrane may undergo a change, as, for instance, chalky degeneration; it is not known whether the contents of the abscess take part in this calcification or not.

Cysts have been found in brains of persons with old purulent otitis, and some authors regard them as old otitic abscesses. Macewen found a thick-walled cyst floating in a brain abscess, which he considered to be an encapsulated brain abscess. Saenger operated on a cyst with sero-hemorrhagic contents in the posterior central convolution in a child suffering from an old otorrhœa and caries of the temporal bone, which he thought represented an old abscess.

Occasionally brain abscesses have made a more or less complete way to the surface. In the two cases from the early literature of the subject, fistulæ in the squama led to the abscess. It is also not uncommon for abscesses to communicate with the external surface by fistulæ through

bony defects in the roof of the antrum or tympanum. Brieger noticed a case where an abscess of the temporo-sphenoidal lobe had emptied itself through a fistula in the tegmen. Sutphen found at an autopsy the complete disappearance of a cerebellar abscess which had spontaneously perforated the skull. It has already been mentioned that abscesses may evacuate their contents into abscess cavities which had been opened. Brain abscesses have also been known to empty themselves into the mastoid wound made at operation. With the exception of a few cases, the patients, where the abscess found an external outlet, nevertheless died, if the pus did not receive a better opening from the surgeon's hand.

Results of the operation for otitic cerebral abscess.

The statistics of cases with results of operation may give a false impression, as a number of unsuccessful cases have not been published; again, cases reported as cured have not been observed for a sufficiently long time. I have, therefore, written to all the authors that have published successful cases, for information as to the subsequent history of their patients.

Schwartz and Broca et Maubrac estimate in their textbooks the number of cases cured by operation to be 50%. Oppenheim found 104 cerebral abscesses which had been operated on in the preceding year with 48 recoveries (46.1%). Körner's very accurate statistics show:

1893:	56.5 %	recoveries.
1895:	55.3 %	"
1897:	50.4 %	"

I have been able to collect 142 cases operated on for cerebral abscess; of these, 59 patients can be considered cured as regards life; in 82, death occurred a certain length of time after operation; and in 1, the result is unknown.

Of those that died:

Six succumbed to accidents in connection with the operation; perforation of the opposite wall of the abscess by the drainage tube, post-operative hemorrhage, shock, asphyxia, hemorrhage during and after the operation, the trocar had reached but not evacuated abscess.

Five succumbed to perforation into ventricles existing before the operation.

Seven to perforation into ventricles after operation. These were complicated by : basilar meningitis, softening of frontal lobes, diffuse meningitis, softening of temporal lobe, extensive encephalitis, meningitis and encephalitis, progressive encephalitis.

Seven to meningitis existing before operation.

Ten to meningitis after operation.

Eight to encephalitis and meningitis ; one of these was complicated with sinus thrombosis.

One to a second, undiscovered abscess.

One to meningitis and a second abscess.

Eight to encephalitis and secondary abscess.

Six to sinus phlebitis and pyæmic metastases.

One to cerebral hernia and subsequent meningitis.

Two to fresh abscesses.

One to apoplexy.

Three to pneumonia, complicated by cerebral hernia ; second abscess, necrosis of cerebrum and sinus thrombosis.

One to abdominal disease and cerebral hernia.

One, no cause found at autopsy.

Five, no cause for death given.

Four, autopsy not allowed.

Most patients died in the first few days or weeks after the operation. Nineteen patients died one month or later after the operation as follows :

One perforation into lateral ventricle (one month after operation).

Eight from meningitis after operation, at following intervals: two months, one year, four and a half weeks, five weeks, two months, three months, four months, two and a half months.

Two from new abscesses.

Three from encephalitis and second abscess.

One from encephalitis and meningitis.

One from apoplexy.

One from pneumonia (six weeks).

One from cerebral hernia and abdominal disease (half year).

One, no cause mentioned (two months).

Aside from the six cases of accidents occurring at the operation, the fatal complication existed in half the cases at the time of the operation. In the greater part of the remaining half the operation could not prevent the extension of the process; in a small fraction of cases, meningitis followed the operation.

Of the cases considered cured, eight subsequently died. In one case, a relapse occurred one year after the operation, though the primary ear-disease was healed. Death occurred from basilar meningitis. In the other seven cases the fatal complication set in two, three, four, and six months after the first operation.

In the 82 fatal cases, the mastoid operation was performed in 60; was not performed in 10; no mention made in 12.

Before entering upon the summary of the cured cases, I should like to discuss the way in which the abscess cavity heals, and after what length of time the process of repair may be considered complete.

After the abscess is emptied, the compressed brain tissue tends to expand. The cavity in acute abscess may be obliterated in a few hours, as Macewen has shown. Older abscesses, with a distinct lining membrane, and where a part of the brain tissue has been destroyed, take much longer, and heal by proliferation of brain tissue and granulations. The termination is a scar in place of the abscess. Autopsy reports describing the anatomical changes during the healing process are very scarce.

In Bramwell's case the large abscess cavity had contracted so completely that it could hardly be discovered, post-mortem, ten days after evacuation. This confirms Macewen's statement. Schubert found a scar at the place of a temporal abscess, five weeks after operation. Bergmann found in a case of traumatic abscess of the frontal lobe, six weeks after operation, a defect in the white matter surrounded by soft reddish tissue. Macewen found in a case of superficial abscess of the temporo-sphenoidal lobe, which had been

operated on, forty-seven days later, granulations at base of temp.-sphen. lobe leading with connective-tissue bands into the brain substance, where some folded-up scar tissue was situated, surrounding a small bead of granulation with a drop of pus. Gussenbauer, seven months after opening a traumatic frontal abscess, confirmed complete cicatricial obliteration of the cavity. In a case of Barker's, an area of pigmentation marked the site of a temporo-sphenoidal abscess, operated several years previously.

The healing process of brain wounds has also been studied on animals. Tedeschi, after resecting parts of the cerebral hemisphere, found that the wound would be healed in 150 to 200 days—that is, a complete cicatrization. To a certain extent the process of repair after resection of parts of the brain can be compared to that going on in abscess cavities. I think that it is justifiable to consider the healing of an abscess cavity from the time of evacuation to be complete in one year. The reported autopsies, and especially the fact that no relapse was noted after one year, together with these interesting experiments on animals, are the basis for this assumption.

Of the 141 operated-on cerebral abscesses, only 59, *i. e.*, 41.8 %, satisfy this condition.

I have been able to collect 33 cases of operation for cerebellar abscesses, with 16 recoveries (46.4 %). This does not by any means prove that the prognosis of the operation for cerebellar abscess is more favorable, as I am quite sure that of the cases of cerebellar abscess published as healed, not all would comply with the above-mentioned conditions.

Of the 59 cured cases operated on for cerebral abscess, 42 are now *surely* still living. The date of the operation is as follows:

1	in	year	1885
1	"	"	1887
2	"	"	1888
2	"	"	1889
1	"	"	1890
6	"	"	1891
5	"	"	1892

3	in year	1893
2	" "	1894
2	" "	1895
13	" "	1896
4	" "	1897

The following 8 patients are *probably* living:

One operated on in year 1886 was well for a long time after operation, then lost track of.

One in year 1888 was seen for the last time three years after operation.

One in year 1888 was last seen in 1897.

One in the year 1890 address unknown, though was living for some time after operation.

One in the year 1890 was last seen in preceding year.

" " " 1891 was well one year after, then lost sight of.

One in the year 1892 was seen $3\frac{1}{2}$ years after.

" " " 1893 was seen four years after.

One case (Barker's) died of pulmonary tuberculosis several years after operation, without appearance of any cerebral symptoms. I have not been able to obtain any information of the remaining nine cases.

The course of healing was generally smooth. In twelve cases during the after-treatment, another operation was necessary on account of threatening symptoms. In a case of Gradenigo's the necrosed cochlea was exfoliated under severe symptoms; in another case of the same author pyæmic fever set in, originating presumably from a cerebral hernia as the sinus proved healthy. Heiman had a case where intermittent fever persisted which finally proved to be malarial. Macewen opened a second abscess thirty-eight days after the first operation; in another case he was compelled to explore the abscess cavity for a second time, two and a half months after the operation, and found pus in the old cavity and presumably a circumscribed arachnitis.

In two cases after-treatment was disturbed by a large cerebral hernia. Stephen had to operate again after ten days on account of recurring focal symptoms. Retention of

pus caused threatening symptoms in two cases. In two cases of which mention has already been made, a second abscess evacuated into the abscess cavity.

In thirty-five of the fifty-nine cases cured as to life, the primary ear-trouble was healed; in four the otorrhœa still persists. I received no information regarding the condition of the ear in twenty cases.

Ten patients suffered from a transient or permanent disturbance, due to the operation. Avoledo's patient experienced severe headache during the first year after operation, was slow at his work, and was generally very much changed. He is at present physically and mentally sound. Barker's second patient suffered from severe trigeminal neuralgia on the operated side. This neuralgia was a symptom before the operation. In Cheyne-Pritchard's case, aphasia persisted at first; patient complains now of headache and his intellect is weak. Four years ago he had one epileptic attack. In Knapp's case the otorrhœa continued until two years after operation; the girl is healthy but for an homonymous hemianopsia. Lindh's patient had an attack of vertigo lasting four hours, three years after operation. In February, 1888, there was an attack of unconsciousness for two hours. Patient otherwise has been well and follows his profession as merchant. Moore's patient had a weakness of right arm and slight contracture of fingers at time of publication. In Poulsen's case, vertigo was complained of after severe exertion. Nine years later patient was well. The patient operated on by Schede in 1885 is living, though was troubled with disturbance of speech for a long time. Schede's second patient was considerably changed during the first year. He was listless, distrustful, and irritable. During one night he had what seemed to have been an epileptic attack. This weakened condition of the brain slowly entirely disappeared and the man has been perfectly normal for years. Willis writes that his patient has remained mentally backward, and complains of headache, and is very excitable. Six months ago she suffered from sudden attacks of unconsciousness.

The chief disturbances in the general condition of cases of

otitic cerebral abscess which have been operated on are, as we have seen, sudden though infrequent attacks of dizziness which in most instances lead to unconsciousness. In two of the cases these attacks were regarded as epileptic. These are not, however, truly epileptic as are frequently observed after operations for traumatic brain-abscess, as the attacks have occurred only once or twice. According to Macewen, these attacks of unconsciousness are due to traction of the scars adherent to the meninges.

Among the last-mentioned ten cases only two suffered permanently after the operation in mind and in body. The others can surely be considered as cured. We have, therefore, 57 permanent cures in 141 operated cases (40.4 %). This result, of course, does not entitle us to exaggeratedly optimistic views; at the same time the very unfavorable attitude of some authors is refuted.

We now have but to consider, from the findings of our statistics, which cases offer the best outlook for recovery, and by which operative methods the best results can be obtained.

The age of the patient comes here into consideration only from the fact that any severe operative interference on very young children and very old people gives an unfavorable prognosis. Brain abscesses however occur but very rarely at these two periods of life, so that the percentage of the various ages in the cured cases is the same.

Eleven abscesses (42.3 %) of the 26 following acute otitis were cured. Forty-seven abscesses (43.1 %) of the 109 after chronic otitis were cured. Hence the prognosis of the operation of brain abscess is the same whether following acute or chronic ear-trouble.

On the other hand the acute or subacute abscesses give a much better prognosis for recovery than those running a chronic course:

Of 58 abscesses running an acute course 30 (51.7 %) were cured.

Of 16 abscesses running a subacute course 8 (50 %) were cured.

Of 11 abscesses running a chronic course 2 (18 %) were cured.

The symptoms which give the indications for the operation do not help us much as regards the prognosis. Cases with normal or subnormal temperature are in general more favorable than those which run a violent course.

In the presence of normal or subnormal temperature the abscess will probably not enlarge rapidly, as the virulence of the infection does not seem to be great and it can be assumed with considerable certainty that the abscess is uncomplicated. Uncomplicated abscesses, of course, offer the best prognosis. In our list of cured cases only four had intracranial complications; in 3, an extra-dural abscess, and in 1 a sinus phlebitis was present. In the uncomplicated cases 22 had fever; in 25 the temperature was normal or subnormal.

The presence of focal symptoms before operation is of no value in estimating the future course. Of all the operated patients 62.2 % had focal symptoms and 37.8 % had none. Of the cured patients 62.4 % had focal symptoms while 37.6 % had none.

The side on which the abscess is located and the patient's sex are of no prognostic value.

Size and site of abscess are, of course, very important for the prognosis. As Körner has shown the small abscesses are situated usually near the surface of the brain. These offer naturally a better prognosis than the larger and deeper-seated abscesses where the danger of perforation into the lateral ventricles is always present.

The contents and walls of the abscess play an unusually important role in the prognosis. First of all, it is important to know if the abscess contains pathogenic germs or not. The bacteriological and microscopic examination of the pus will solve this point. Color and odor of the pus give us no clue as to its virulency.

The cases where deep depressions and hollows exist in the walls of the abscess with no lining membrane can be regarded as unfavorable. These cases usually show their severity before the operation by threatening symptoms and

may exist under the picture of a meningitis. It is impossible in this case, even with the greatest care, to control the suppuration or prevent pus-retention.

The cases where after operation more and more of the surrounding brain tissue is destroyed, give a bad prognosis. The various methods of operation are represented in our statistics as follows:

Of the 81 operated through the squama 31 (38.3 %) were cured.

Of the 43 operated through the tegmen 18 (40.2 %) were cured.

Of 7 cases where the combined opening was made through the squama and the tegmen, 5 (70.1 %) were cured.

The last therefore gives the most favorable results.

An alphabetical table of these 142 cases of otitic brain abscess published as cured, with brief notes on the symptoms, method of operation, course, and remarks, together with references in the literature, can be found in the German original, *Zeitschrift für Ohrenheilkunde*, vol. xxiv., p. 96 and following, which, on application to the editor, will be sent for reference to any one of our readers.

ON THE INTESTINAL DISTURBANCES PRODUCED BY OTITIS MEDIA OF INFANTS.

BY DR. ARTHUR HARTMANN, BERLIN.

Translated by Dr. FELIX COHN, New York.

AFTER having established the fact¹ that the presence of a purulent otitis media in infants can, in almost all cases, be determined by otoscopic examination, I devoted myself to the task of investigating the relation between the otitis media, the nutrition, and the intestinal tract of the infant.

Tröltsch, who entered upon the discussion of the otitis of infants most thoroughly in the various editions of his textbook, while he disclaimed any clinical experience upon this subject, on theoretical grounds and upon the results of post-mortem examinations concluded that the pathological changes caused by middle-ear inflammation must necessarily, as in the adult, affect the entire system of the infant. He believed that, inasmuch as infants could not locate the seat of pain, and inasmuch as a satisfactory objective examination and a functional test of the hearing power were impossible, a diagnosis of otitis media could not be positively established.²

In my first publication, I proved that, in infants suffering from any disease, a complicating otitis may cause elevations of temperature. As an example I had cited the case of an infant suffering from broncho-pneumonia, in whom paracentesis on four different occasions immediately reduced the

¹ "Otitis Media of the Infant." *Deutsche medic. Wochenschr.*, No. 26, 1894.

² *Lehrbuch der Ohrenheilkunde*, 7th edition, S. 435.

temperature. From my investigations, pursued in the Institute of Infectious Diseases, together with Professor Kossel, I had drawn the following conclusions:

1st: The otitis media of infants may be accompanied by disturbances of nutrition, as evidenced by dyspepsia and emaciation.

2d: Upon evacuation of the contents of the middle ear through paracentesis, the disturbances in digestion disappear, and an increase of weight follows.

3d: Elevations of temperature occurring in the course of intestinal disturbances may be referred to a complication with otitis.

4th: In all intestinal affections of infants, accompanied by elevation of temperature and reduction in weight, an examination of the ears for the possible presence of otitis should not be neglected. Walb, Barth, Göppert, Ponfick, Steiner, and Heermann, shortly after the publication of my clinical observation, likewise published their experiences. My studies were made together with Dr. Finkelstein at the clinic of Dr. Heubner, who most cordially placed his material at our disposal.

Göppert arrives at the conclusion that the otitis which we find frequently in connection with intestinal diseases is caused by the latter affection, and considers the nausea and persistent vomiting of infants as an important ætiological factor in producing the otitis. In spite of the purulent character of this intestinal otitis Göppert believes it to be a far less dangerous form of aural inflammation than the otitis produced by coryza. Göppert was not able to find that an otitis alone, without intestinal disturbances, should produce diminution of weight, but on the contrary had observed remarkable increases of weight during the progress of the inflammation. He found fever due to the otitis in five cases; in three cases shortly after the rise of temperature, perforation of the tympanum; and in two cases he performed paracentesis. In the course of almost five months he had only observed one positive case. The fæces and urine were normal; bronchitis was absent. The drum bulged on one side only. In spite

of the otitis ¹ there was marked increase in weight. His observation, however, is not convincing, for the reason that the weight was recorded only on the fourth day after paracentesis had been made. His observation only proves that the recovery after paracentesis caused a very rapid increase in weight.

Ponfick ² observed in a number of his children, in the first and second years of infant life, intestinal disturbances which were accompanied by rise of temperature, and followed in a few days by sensitiveness of the auricular region, by crying, and motion of the hand to the affected ear. As soon as perforation occurred the fæces again became normal. In these cases the otitis was evidently the primary cause of the intestinal disturbances.

Barth, studied ³ his cases in the outdoor department for infants and children up to three years of age.

Steiner ⁴ reports his observations, which were gathered at the polyclinic in Breslau. He attempted to study the effect of the otitis media upon the general condition. The results of his observations appear to me based on unsatisfactory methods of research, and I shall therefore not report them in detail.

One of the reported cases is as follows:

Child four weeks old, was nursed at the breast until a few days before its appearance at the clinic, when the child received milk and tea in equal parts. Since its birth the child has suffered from convulsions, for one day diarrhoea and vomiting. *Status praesens*; well-nourished child; the weight 3460 gr.; heart and lungs, with the exception of a few ronchi, normal. During the time of observation, the weight of the child, in spite of regular food, decreased; numerous intestinal movements of watery character; weight decreases within two weeks 310 grammes. From now on gradual improvement, increase of weight after two weeks, weight of child 3510 gr.; further increase up to 3660 gr. when,

¹ "Untersuchungen über das Mittelohr des Säuglings im gesunden und krankhaften Zustande." *Jahrb. f. Kinderh.*, B. xlv.

² Ueber die allgemeinen pathologischen Beziehungen der Mittelohrerkrankungen im frühen Kindesalter.

³ *Zeitschrift f. Ohr.*, B. xxxii., S. 119.

⁴ "Otitis media der Säuglinge und ihre Folgen." *Prag. med. Wochenschr.*, No. 21, 1898.

with this established weight, a purulent otorrhœa became manifest.

A review of this case clearly shows that the diagnosis of otitis media was made only at the appearance of otorrhœa. At the first examination no otoscopic examination was made and no temperature taken. As the child evidently screamed and slept uneasily for some time before its inspection at the polyclinic, we must assume that the otitis really caused the intestinal disturbances and the diminution in weight.

Heermann¹ gave a further contribution to this subject. His deductions were based only on the results of post-mortem examinations, and really only corroborated the results of former investigations.

Ponfick's observations, that the intestinal disturbances are observed in the course of otitis, seem correct. When cholera-like diarrhœas are observed in infants, the otitis media may be found on examination. After paracentesis the intestinal disturbances gradually disappear. Careful weighings likewise show the influence of the otitis upon the general condition. As soon as the paracentesis is made, the decrease in weight is replaced by an increase. That we are not dealing with a secondary otitis, may be deduced from the fact that the intestinal disturbances occur simultaneously with the rise in temperature resulting from the presence of an exudate in the tympanic cavity.

Göppert rather refers the otitis to the act of vomiting and therefore considers it to be secondary. I cannot believe this ætiology, because we find the otitis as frequently accompanied by intestinal trouble as by respiratory affections.

Ponfick refers the intestinal affection to the resorption of toxic poisons from the exudate. This appears very likely, since all purulent affections in infant life lead to gastric disturbances. Rise of temperature in the course of intestinal diseases of infants, just as in broncho-pneumonic affections, is usually caused by a complicating otitis media.

In adults we observe quite often that chronic otorrhœa affects the general organism, and we may surely assume that

¹ "Ueber Otitis media im frühen Kindesalter." (Otitis concomitans). Verlag von Karl Markold, Halle, 1898.

the same relation between otitis and the general health occurs in infants. The relation of the atrophy to the otitis has not yet been satisfactorily solved, because the infants upon whom these observations are made are usually in a hopeless condition.

We may deduce the following from the recorded observations:

1. Acute febrile otitis causes a diminution in weight, or arrest of increase in weight.
2. Otitis accompanied by grave septic symptoms probably causes diarrhœa.
3. An acute febrile otitis occurring during intestinal diseases may act upon the general constitution, and by reducing the vitality, aggravate the intestinal affection, or retard recovery.
4. Whether there is a direct relation between atrophy and an otitis, must be reserved for further observations.

A report of the following histories will serve as an illustration of our deductions:

CASE 1.—Simultaneous Occurrence of Acute Otitis, Intestinal Disturbances, Diminution in Weight and Rise of Temperature. After Paracentesis, Improvement in Digestion, Increase in Weight, Fall of Temperature.

Else Zellmer, three months old, entered on the 19th of January, 1898, became ill on the 11th of January with symptoms of vomiting and diarrhœa. Child, well-nourished, pale, appears to be suffering, is restless, screams continuously. Respiration very superficial, accelerated, and interrupted occasionally by convulsive twitchings. Lungs normal; no vomiting. On the 20th of January, evening temperature 39.5° C. On the 21st, the otoscopic examination reveals a reddened membrane on the left side, somewhat bulged. After paracentesis, a serous exudate. On the next day, child is much quieter. In the evening, a normal movement. On the 25th of January, child dismissed as cured.

CASE 2.—Erich Schäfer, six months old, entered on the 7th February, 1898, suffering with general eczema. Besides an eczema, the child was suffering from coryza, and acquired a bronchitis. Before the latter affection, the stools were normal, temperature 37° ; on the following day, one normal, two altered

stools ; temperature 39.6° C. ; on the 9th, two altered movements ; temperature 39.7° ; on the 10th, two altered movements ; temperature 38.6° ; double paracentesis. Twelfth, again double paracentesis on account of poor drainage ; 14th, temperature 36.4° C. ; movement normal. On the second attack, temperature rose to 40.6° , the perforation and purulent discharge still present on one ear, while on the other a paracentesis became necessary. Child was somnolent ; did not react to pinching or on catheterization of the bladder ; beginning rigidity of muscles of neck ; anuria lasting over twelve hours. All these symptoms immediately disappeared after paracentesis. On the first attack, decrease in weight from 6220 to 6010 gr. ; on the second, decrease from 5910 to 5350 grammes.

CASE 3.—Simple Diarrhœa which Assumed a Cholera-like Character during the Attack of the Otitis and Improved Rapidly after Paracentesis.

Emily Strauss, four and a half months, admitted 10th of May, 1898 ; on admittance, formed movement ; on the 22d, stool has the consistency of gruel, and contains some mucus. Twenty-third : child uneasy, screams, temperature 38.9° . Twenty-fourth : movement watery, temperature 39.2° ; paracentesis on right side. Twenty-fifth : child calmer, temperature 36.1° . Twenty-sixth : movements improved, temperature normal. Decrease in weight from 2480 to 2320 ; from the 27th of May to the 3d of June, further increase 180 grammes.

CASE 4.—Pietruschka. Fourteen days old ; admitted with a purulent umbilicus on the 14th of May ; movement and temperature normal. Fifteenth : restless, screams, four diarrhœic movements, temperature 38° , tympanum bulged, paracentesis on left side. Sixteenth : child still restless, diarrhœa, temperature 38.1° , tympanum bulged on right side, paracentesis ; after latter paracentesis, movements improve, child becomes calmer, weight decreases from 3050 to 2960 and gradually rises to 3090 grammes.

CASE 5.—Margarethe Kuske, seven months old, admitted on the 19th of March suffering from streptococci enteritis, improves rapidly ; on the 20th movements fairly well-formed ; on the 29th, frequent coughing spells ; face cyanotic ; had screamed during night incessantly ; respiration not accelerated ; temperature 38.8° C. The otoscopic examination reveals reddened and bulging drum-membranes ; paracentesis ; exudate serous. Urine

somewhat turbid, contains albumen, hyaline, epithelial, and granular casts, a few leucocytes. On the 31st both ears are dry, perforations closed, tympani of pale color. Temperature remains normal. The weight, which had remained the same while the temperature was rising, in 10 days increased 500 grammes (from 3510 to 4010 grammes).

CASE 6.—Protracted Otitis Accompanied by Intestinal Disturbances and Slight Febrile Symptoms.

Gertrude Fordan, orphan, two and a half months old, admitted on the 30th of November, 1897, suffering with dyspepsia and coryza; on the 5th an examination reveals a double otitis; on the 14th double paracentesis, indicated on account of persistent slight temperature and no improvement in the condition of the child; after paracentesis temperature becomes normal, marked increase in weight and normal movements. On the 20th paracentesis again repeated on left ear. Later on renewed intestinal disturbances and exitus on the 14th of February.

CASE 7.—Chronic Otitis Accompanied by Gradual Decrease in Weight and Ending Fatally.

Else Zellmer had been treated two months previous on account of acute otitis (see Case 1); is again admitted on account of diarrhoea on the 15th of March. Stools diarrhoeic and mucoid. From the 15th to the 19th, loss in weight amounted to 360 grammes. On the 21st, temperature 39.9° ; paracentesis on both sides. On the 22d, increase 120 grammes; temperature 38° ; 23d, movement the consistency of gruel; on the 24th, well-formed. On the 7th of April, weight 4410 grammes. After that, repeated closures of perforation requiring renewed paracentesis. On the 16th, rise of temperature accompanied by loss in weight; after paracentesis, fall of temperature, and maintenance of weight without loss or increase. As the otitis did not progress, an opening of both mastoids was considered; on the 8th of May temperature rises to 38.9° , rapid marasmus; death ensues on the 9th of May.

In spite of frequently repeated paracentesis there was no increase in weight. Probably the opening of the mastoid cells might have had a more favorable influence on the course of the disease.

CASE 8.—Fongyschowska, four months old, admitted on the 18th of February, 1898, suffering from bronchitis and furuncu-

losis. On the 11th of April, movements normal ; on the 12th, diarrhœic, temperature 39.2° ; on the 14th, incision of furuncles with corresponding improvement in character of movements ; on the 16th and 17th, paracentesis on right side, incision of furuncle on left ; from the 21st of April on, increase of weight and normal movements.

CASE 9.—Krajeck, thirty days old ; orphan, emaciated, cyanotic, crying, frightened expression. On the 30th of December, movements frequent, greenish, watery ; on the 4th of January, movements likewise unhealthy. Double paracentesis, pus present in both tympanic cavities. On the 7th of January, right-sided pneumonia, otorrhœa. On the 15th, furuncles in both ears. On the 5th of February, right ear cured ; on the 7th, left ear cured. During the further course of the disease, the intestinal disturbances still remain present, besides formation of abscesses in lymphatic glands. On the 27th of February, exitus letalis.

THE DIAGNOSIS OF INFANTILE OTITIS.

The difficulty in the diagnosis is caused not so much by the narrowness of the canal or the oblique position of the tympanum as by the presence of wax and scales in the external canal. According to my records, an otoscopic examination failed in about half the cases, the failure being due either to the presence of small scales, or, frequently, to the formation of a fine membrane covering the tympanum and composed of dried vermix caseosa, desquamated epithelium, and other foreign substances. A cleansing of the canal may be most easily accomplished by removing the detritus or membrane if possible without syringing, and in one piece by carefully loosening the membrane from its surroundings with a probe and then extracting it with a knee-forceps. I generally employ a thin copper probe. For inspection, a very narrow ear speculum must at times be employed, and the forceps should be adapted especially for this purpose. A proper artificial light or sunlight with a plane reflector are most necessary adjuncts. Occasionally one might be able to employ a little wider ear speculum. Göppert first advised instillations of oil, but later on resorted to my method.

One readily determines the location of the tympanum by

means of the handle or short process of the malleus. The short process appears frequently as a white prominent point easily distinguished from the reddened and infiltrated tympanum. Frequently the posterior portion of the drum membrane bulges. In the latter case the handle of the malleus is almost hidden from view, the short process invisible. Under such condition, the diagnosis may become quite difficult, because the posterior wall and the prominent bulging posterior portion of the tympanum also merge in one another, and one may be inclined to consider the bulging tympanum as part of the external wall of the auditory canal. The use of the probe in such a case is of the utmost importance.

In dubious cases an exploratory puncture may be permissible. Frequently the examination appeared to reveal a normal drum membrane. The paracentesis or in some cases the post-mortem examination proved the presence of an exudate in the tympanic cavity. The reverse likewise occurs: an apparently infiltrated membrane without an exudate.

Göppert is inclined to refer the difficulty of the otoscopic examination in infants to the obtuse angle formed by the tympanum and the posterior wall, thereby interfering with the transmission of light and diminishing the transparency of the inspected membrane.

There is, however, another cause for the difficulty of the inspection of the tympanum in infants. The external surface of the funnel-shaped tympanum is slightly convex, with the convexity in the direction of the auditory canal. The portion adjoining the short process likewise bulges slightly in the same direction. This prominence is in reality very slight, but on account of the variation from the direct line of view, and the natural curvature of the tympanum this prominence appears magnified and is apt, therefore, to be taken as a bulging of the posterior superior quadrant. This apparent outward prominence, which even in the normal tympanum frequently holds the handle of the malleus from our view, appears in perspective, therefore, to be almost at right angles to the posterior inferior quadrant,

and on a plane corresponding to a line drawn from the external opening of the auditory canal to the upper border of the eyebrow.

There is no direct relation between the degree of injection and the character of the exudate, an almost purulent exudate being frequently accompanied by an almost normally colored tympanum. Much more importance should be attached to the opacity of the tympanum, which sometimes, as only one symptom, may enable one to diagnose an otitis media. Occasionally we find an accumulation of pus in the tympanic cavity, when the tympanum appears almost white and shiny, a condition caused by an accompanying high degree of anæmia. In some cases a dark injection and color of the drum membrane will lead us to the diagnosis of exudate in the tympanic cavity. Göppert, as well as myself, has been able to inspect the drum membrane even in still-born infants.

THE TREATMENT OF INFANTILE OTITIS MEDIA.

V. Tröltsch, who in his text-book discussed most thoroughly the results of the post-mortem examination in infants suffering from otitis media, made no attempt to elucidate the methods of examination in the living, and was, therefore, naturally unable to recommend a method of treatment. He only theoretically refers to the use of the Politzer bag, inasmuch as inflation, by opening up the Eustachian tube, would give vent to the exudate pent up in the tympanic cavity and in the upper portion of the tube.

Shortly after my publication, Walb studied this subject, the treatment of otitis in infants, and reported his results at the fourth meeting of the German Otological Society (1895, *Verhandlungen*, S. 144). He desired a method that could be used in every case, and recommended inflation in order to assist drainage and completely expel the purulent secretion from the tympanic cavity. Inflation is very readily accomplished, since the tube in infants and children may be opened by the slightest air-pressure. At the meeting a number of objections to this method of treatment were

brought forward, and it was decided to await further observation before recommending the proposed method.

The treatment of otitis in infants may be based upon the principles underlying the treatment of otitis in adults. In the cases that are accompanied by restlessness, pain, screaming, fever, and emaciation, paracentesis should be made without delay. After thorough cleansing and careful disinfection, the inferior portion of the membrane should be incised. When the exudate, welling out of the opening, is carefully dipped up with a pledget of cotton saturated with peroxide of hydrogen, I usually inflate, in order to expel the exudate from the tympanic cavity. This procedure is repeated daily, and only on rare occasions do we find the tube impervious for the current of air. After inflation the auditory canal is closed with pieces of gauze. The gauze is introduced as deeply as possible, and it is immaterial whether sterilized iodoform or nosophen gauze is used. In case the opening in the tympanum closes before the cavity is entirely free from exudate, the paracentesis should be repeated. The same treatment may be followed even in cases where a spontaneous perforation has occurred. If the perforation is very large, boracic acid in the form of powder may be insufflated after the ear has been thoroughly cleansed.

If the main symptom appears to be pain, the attempt might be made to cut short the inflammation by using a solution of carbolic acid in glycerine. I usually employ a solution of one part of carbolic acid to ten of glycerine. The warm solution is poured into the auditory canal and pressed towards the tympanum by repeatedly compressing the tragus with the finger. The solution is allowed to remain a few minutes, and then will be removed with absorbent cotton. I have frequently seen children completely quieted by the use of these warm instillations.

Gomperz recommends most highly tampons saturated with acetate of aluminium solution (equal parts of liquor Burowi and distilled water) introduced warm or tepid and changed every two hours. In case there are no urgent symptoms and the presence of the otitis has been diagnosed only by the otoscopic examination, an expectative treatment

is advisable. Should, however, a resolution not take place spontaneously, paracentesis should not be delayed. Frequently, even in atrophic infants, although no bulging of the membrane may be apparent, an exudate may be present in the tympanic cavity.

In case the secretion remains copious and purulent, particular care must be taken to maintain a sufficiently wide opening in the tympanum in order to assist drainage. The mastoid process is usually involved, but the exudate in the antrum drains through the tympanic cavity, and in spite of this involvement recovery may take place without resource to opening of mastoid. Insufflations of boracic acid aid the recovery, and there is no danger of a retention, because the powder is generally dissolved by the exudate. If the secretion does not diminish, in spite of the inaugurated treatment, the mastoid should be opened. Should there be œdema or an abscess in the region of the mastoid, an operation is absolutely indicated. One frequently finds granulations and detached particles of bone or even large sequestra sometimes containing the entire posterior osseous portion of the auditory canal.

The general condition of the little patient must not be neglected. A more rapid recovery from the otitis may be expected if the physician is enabled to maintain a general good condition of the infant, a not easy task among the poor or in the hospitals, where artificial feeding must so frequently be resorted to.

The condition of the nose is also of the greatest importance. Fluctuations in temperature must be carefully avoided; nasal respiration should be maintained if possible by carefully removing the nasal secretion and keeping the nares patent. I have frequently observed that nasal catarrhs are cured by closing the mouth of the screaming infant, and forcing it to breathe through the nose. Nasal respiration may be aided in obstinate cases by forcing air through the nose with a small rubber bag, and employing at intervals a one-per-cent. cocaine spray. Not a very great deal of fluid is required to increase the respiratory space. If the secretion is very purulent, a one- to two-per-cent. saline solution or a weak solution of

peroxide of hydrogen may be forced through one nostril with a small syringe, while the head of the infant is held downwards. Sometimes we employ these solutions in the form of sprays. Very favorable results have also been obtained by the use of 1 : 1000 nitrate of silver sprays.

I have rarely found adenoid vegetations present in infants, nor have I been able to find them in post-mortem examination. The presence of adenoid vegetation is probably a rare complication. Gomperz reports having found post-nasal growths, and removed them, in extremely young infants.

SARCOMA OF THE MIDDLE EAR.

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SARCOMATOUS growths of the middle-ear cavity are very infrequently met with. Bezold¹ of Munich, during the years 1893 to 1896, reports having treated 5327 ear patients and encountered sarcoma of the middle ear but one time, while Gruber² in his Vienna clinic, during 1890 and 1891, reports having treated 10,157 new ear cases without recording a single patient with middle-ear sarcoma.

The following remarkable case came under my observation August 2, 1898. A little girl three and a half years old, according to the mother, who is a widow, first complained of earache in January, 1898. The pain lasted but a night or two and ceased without special treatment, nor was it accompanied or followed by an otorrhœa. The child has never had measles or scarlet-fever nor has it ever been much sick. The father died of consumption and the mother is herself a pale, delicate, and highly nervous little woman. In March following, the child again had earache a night or two, followed in two weeks by a discharge from the right ear. The mother of her own accord syringed the ear daily for several days and thought she had cured the trouble. In April the mother detected in the right ear canal a small reddish growth which slowly became larger and caused the ear to run. She consulted Dr. H. T. Dixon on June 20, 1898, who furnished me the following record: The discharge from the ear was somewhat offensive,

¹ ARCHIVES OF OTOLGY, vol. xxvii., No. 4.

² *Monatschrift für Ohrenheilkunde sowie für Kehlkopf-, Nasen- und Rachenkrankheiten*, May and October, 1892.

and filling the right auditory canal was a reddish fleshy growth which he took to be a polypus and removed with the cold wire snare. The external ear and the region about it was free from soreness or swelling and he ordered that the ear be daily syringed with a warm aqueous solution of boric acid. On June 24th he removed more of the fleshy growth by the snare with only a slight amount of bleeding. The syringing with the boric acid solution was daily repeated and the child retained under observation. In about ten days the growth returned, and he now administered chloroform in his office and attempted under anæsthesia a more thorough removal with the snare than had been possible previously without narcosis. The operation was repeated in this way some four or five times at intervals of about fifteen days, but at no time was the accompanying bleeding severe enough to require special treatment. The child did not complain much of ear pain nor did it receive treatment for earache and at no time was it enough indisposed to keep it from following its usual everyday life. A few days after his last using the snare, the doctor observed an enlargement back of the auricle and over the mastoid which rapidly increased in size but did not occasion fever or other symptoms of ill health. He now requested the mother to consult an ear specialist and directed them to call at my office August 2d which they did, **when the following was entered into my record book**: The child is thin and anæmic and inclined to be irritable. Protruding from the external auditory canal is a reddish and somewhat irregular fleshy growth, not painful upon contact with the ear probe and not disposed to bleed much after a gentle examination. The ear discharge was of a thin sanguino-purulent character, not profuse, and not very offensive. Back of the auricle and over the mastoid region was a smooth swelling of a soft doughy consistence and of the size of a small hen's egg. The skin over the swelling was not involved in the tumor neither was it inflamed or painful upon pressure. The mother was told that the tumor had its origin in the middle ear and that the only possible source of relief was through an operation. Accordingly, August 5th, with Dr. Dixon administering the anæsthetic, an incision was made about two inches long back of and parallel with the insertion of the auricle through the skin and into the tumor. The skin flaps were dissected free from the growth and this finally incised down to the mastoid bone. Neither pus nor cheesy matter was found but instead a soft

and reddish-gray fleshy mass that upon compression yielded a pale grayish-white juice, and which was easily and quickly removed by the sharp curette. The bleeding was not severe and required no special attention. As anticipated, the outer table of the mastoid was eroded in several places, through the ragged openings in which the growth was followed by the sharp curette and as much of it as possible removed from the mastoid cavity and antrum. The polypoid growth in the external auditory canal was snared off and preserved for microscopical examination. The mastoid opening was packed with iodoform gauze over which an external dressing of absorbent cotton and a bandage were applied. The two following weeks I was absent from home during which time Dr. Dixon attended the little patient. He reported removing the primary dressing the third day and thereafter renewing the dressing every second day. By the end of one week there was a noticeable return of the tumor not only through the opening in the mastoid but in the auditory canal. In a few days more he detected facial palsy, then aphonia, and difficulty in swallowing. I again saw the patient August 25th, and found protruding throughout the line of incision an angry-looking fleshy mass with a tendency to break down and ulcerate in the centre. The lymphatic glands around the external ear were, in common with the parotid gland, very much enlarged. Laudanum was daily administered to relieve pain. The facial palsy remained complete, but the voice was partially regained and the swallowing improved. October 14th, or about nine months since the first attack of earache, the child died in convulsive movements, but with retained consciousness up to within fifteen minutes of the end.

A portion of the tumor removed from the external ear canal at the time of operation was submitted to Prof. Jos H. Linsley of the University of Vermont who made the following report: "The mass examined is made up largely of embryonic tissue, the cellular elements predominating, and are principally small round cells with a fair number of spindle cells. The growth is fairly muscular, the blood-vessel walls being very thin and in close relation with the tumor cells. A tendency to grouping of the round cells is seen in places. **The growth is a small round- and spindle-cell sarcoma.**" All authors recognize the difficulty in de-

termining the point of origin of sarcomatous growths found within the middle ear. In the one instance it may be the periosteal lining of the tympanic cavity, and again it may be the lining of the mastoid cells. Schwartz is of the opinion that the dural covering of the petrous portion of the temporal bone is the starting-point as a rule, and that later the tympanum is affected. We find the disease occurring in persons who for years have had a suppurative middle-ear disease, and again in those who have had only an acute otitis media. The greatest number of cases however are reported in persons who previously have had no middle-ear disease at all. Age bears a much more important relation to the development of sarcoma than the existence or not of a previous middle-ear inflammation. By far the greatest number of cases have occurred in childhood, and the duration of life averages less than one year. As a rule, the beginning of the disease is unattended by pronounced symptoms, but as soon as the drum is perforated and a polypoid formation is found in the external canal, otorrhœa arises either of a serous or bloody character. Hartmann¹ however maintains the reverse from this and says pain during the development of the growth, as a rule, is severe, and reports a case of round-cell sarcoma in a three-and-a-half-year old child which otherwise pursued a course very similar to my own. The diagnosis is not always easy, especially when the new formation is extremely soft and semi-fluctuating to palpation, and a number of times such cases of sarcoma have been mistaken for retro-auricular abscess.² With a complete history of the case and after having had it under observation for a time, and in addition made a microscopical examination of such part as could be easily removed by the snare, there is little danger of erring in the diagnosis.

¹ Hartmann, *Krankheiten des Ohres*, p. 249.

² Bezold in Schwartz's *Ohrenheilkunde*, vol. ii., p. 335.

A CONTRIBUTION TO THE TECHNIC OF PERFORATING THE MAXILLARY ANTRUM.

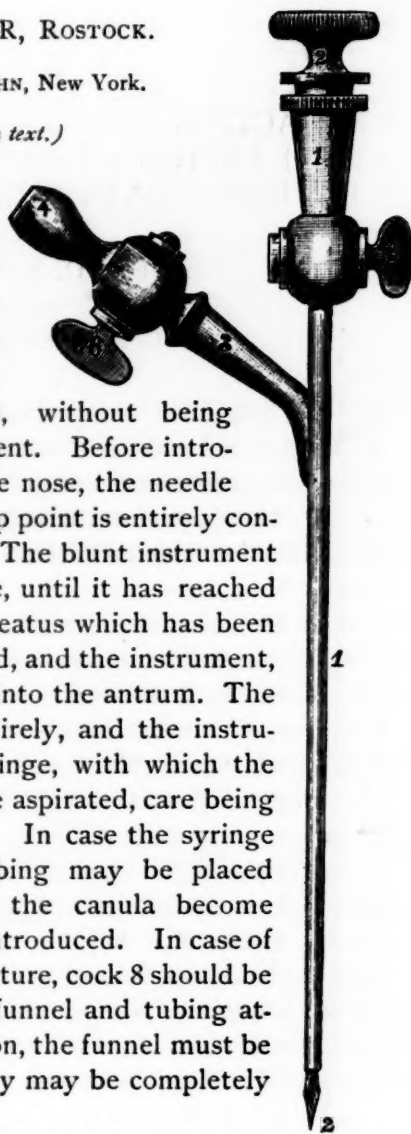
BY PROF. O. KOERNER, ROSTOCK.

Translated by Dr. FELIX COHN, New York.

(With illustration in text.)

THIS instrument (see illustration) enables the operator to perforate into the antrum for diagnostic purposes, and to follow up, if desirable, the exploratory puncture with an irrigation, without being obliged to remove the instrument. Before introducing the instrument into the nose, the needle (2) is drawn back until the sharp point is entirely concealed within the canula (1). The blunt instrument is then introduced like a probe, until it has reached the location on the inferior meatus which has been selected. The point is exposed, and the instrument, being grasped firmly, is forced into the antrum. The needle is now withdrawn entirely, and the instrument is connected with a syringe, with which the contents of the antrum may be aspirated, care being taken to close the cock at 6. In case the syringe is too loose, some rubber tubing may be placed around the canula. Should the canula become blocked, the needle may be reintroduced. In case of an irrigation following the puncture, cock 8 should be closed, cock 6 opened, and a funnel and tubing attached to 4. After the irrigation, the funnel must be lowered, in order that the cavity may be completely drained of its fluid contents.

The instrument may be obtained at "Pfau," Berlin, Dorotheenstrasse 67.



THE ACTION OF THE SEA-CLIMATE AND OF
SURF-BATHING ON AURAL AFFECTIONS AND
HYPERPLASIA OF THE PHARYNGEAL TONSIL.

BY PROF. O. KÖRNER, ROSTOCK.

Translated by Dr. FELIX COHN, New York.

SEVERAL of our professional brethren have expressed decided opinions on the influence of the sea-climate upon aural affections and upon hyperplasia of the pharyngeal tonsil. These opinions, however, have been more dependent on subjective impressions than upon systematic investigations.

The following studies were undertaken in the summer and fall of 1898, in order, if possible, to obtain actual data in regard to this important medical question. The material, however, which has been at my disposal has been far too small to draw any broad conclusions, and I am led to publish the interesting results only in the hope that some of my colleagues may be led to undertake similar investigations.

The Friedrich Franz Hospital at Gross-Müritz, a place situated on the Baltic, admits debilitated and sick children for six weeks, in order to give them the benefit of forest-air and sea-bathing. I have examined 144 children, both at the time of their admission and departure. The pharyngeal tonsil was not removed in any of the cases, and the ears affected with otorrhœa only occasionally syringed.

The children, who were of both sexes, vary from four to fifteen years in age. The diagnosis in the respective cases on admission was as follows:

Cephalæa.....	2	chil'n, of wh.	0	were affected with adenoid veget'ns					
Chorea.....	3	"	2	"	"	"	"	"	"
Neurasthenia.....	3	"	0	"	"	"	"	"	"
Retinitis.....	1	"	0	"	"	"	"	"	"
Rachitis.....	1	"	0	"	"	"	"	"	"
Osteomyelitis.....	1	"	0	"	"	"	"	"	"
Bone tuberculosis.....	2	"	0	"	"	"	"	"	"
Kyphoscoliosis.....	3	"	1	"	"	"	"	"	"
Scrophulosis.....	47	"	20	"	"	"	"	"	"
Pulm'nary tuberculosis	12	"	2	"	"	"	"	"	"
Bronchitis.....	9	"	1	"	"	"	"	"	"
Vitium cordis; palpi- tation of heart.....	4	"	1	"	"	"	"	"	"
Anæmia; Chlorosis..	33	"	8	"	"	"	"	"	"
Gen'l debility, atrophy	21	"	10	"	"	"	"	"	"
Reconvalescent.....	1	"	0	"	"	"	"	"	"
Tonsillar hypertrophy.	1	"	1	"	"	"	"	"	"
	144		46						

Of the 46 cases with hyperplasia of the pharyngeal tonsil, the tonsil was found very much enlarged in 13, large in 15, and moderately enlarged in 18 cases.

1. 21 children had their home on the sea-coast (from 0-15 kilometres away from the sea line).

2. 34 children resided more inland, in a transition climate (from 15-100 kilometres away from the sea).

3. 89 lived inland, (more than 100 kilometres away from the coast).

Adenoid vegetations were found present in 11 out of 21 cases in the children from the coast; in 9 out of 34 cases in the children from the transition climate; in 25 out of 89 cases in the children living inland.

During their stay at the hospital the following increase in weight was noted :

13	children with very large hyperplasia	gained	1778	grams
15	" " a large	"	2142	"
18	" " a moderate	"	1741	"
98	" without any	"	2183	"

Marked retraction of the tympanum was recorded in 24 cases. These retractions were not affected for better or worse; in none of the cases, however, did an acute middle-ear inflammation occur.

In two cases the retraction of the drum membrane had slightly increased.

Cicatrices of the tympanum were present in seven cases ; in one of the cases a painless otorrhœa occurred, accompanied by a spontaneous perforation through the cicatrix.

Dry perforations were noted in 3 cases ; not one of them developed an otorrhœa. Only two of the children were examined before their departure, but in these no otorrhœa had occurred, in spite of 24 sea-baths in the one case, and 33 in the other.

Tympanic suppuration was present at the time of admission in 6 cases. On their departure the otorrhœa persisted in only 2 cases. In 2 cases the otorrhœa had ceased : in the one case after 17 warm baths, and in the other after 23 cold sea-baths. Closure of perforation in 2 cases !

Minor opacities of the drum membrane were not recorded. In one case a marked opacity of the stratum corneum had been cleared after 27 baths.

Furuncles did not occur in any of the 139 children who were bathing.

I take great pleasure in expressing my sincerest thanks to the director of the hospital, Professor Martins, and to the resident physician, Dr. Wagner, for their kind assistance.

TWO CASES OF OTITIC SINUS THROMBOSIS, THE ONE FATAL, THE OTHER ENDING IN RECOVERY.

By HERMAN KNAPP, M.D., NEW YORK.

(With two temperature charts.)

CASE 1.—Chronic Purulent Otitis in a Child. Sinus thrombosis. Pyæmic Pneumonia. Operation. Autopsy.

January 8, 1898, Josephine Kraffen, æt. ten, of Astoria, L. I., was brought to the New York Ophthalmic and Aural Institute, with the following history. Family healthy, but the child always delicate. She had ear trouble since her first year, discharge off and on for a year or two. Then the otorrhœa ceased until September, 1895, when she had earache on the left side, followed by otorrhœa and abatement of pain. The otorrhœa continued—stopping sometimes for a day—until September 24, 1895, when it ceased completely. On the following morning the child cried from pain in the left ear and the forehead, which in the afternoon had extended to the occiput. These symptoms continued ten days. Then,

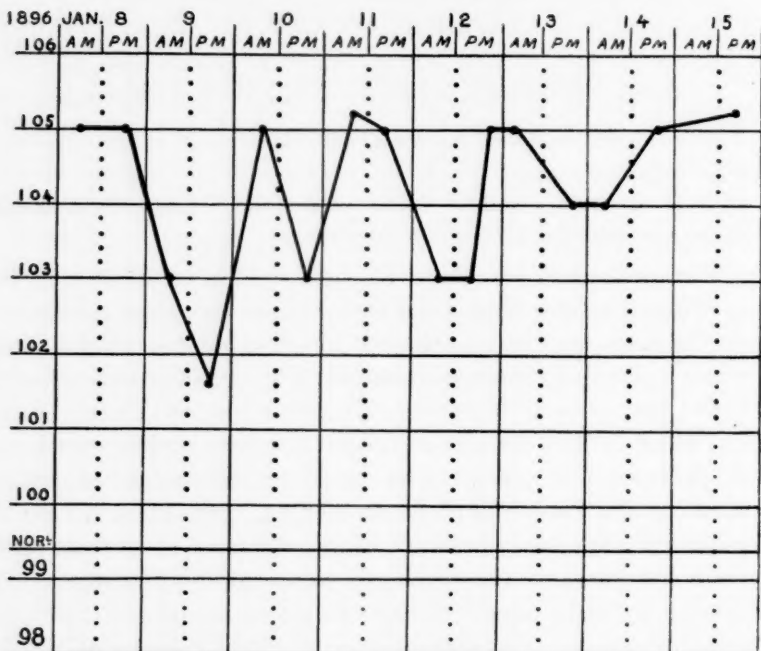
January 4, 1896, she complained of dizziness, vomited twice, whereupon she had a *shaking chill followed by fever*. The four following days she was excitable and had hyperæsthesia of the skin; touching of the skin made the child cry out. On the 7th, the child had another chill. She complained principally of pain in the neck and left shoulder. She has lost flesh and has suffered from constipation during the last two weeks.

Condition on admission.—Emaciated small child, is in an apparent stupor (received morphia yesterday and to-day), but answers questions rationally. Eyes partially open, pupils narrow, but responsive to light. Cries from pain when touched. Mastoid

on both sides normal, the left slightly larger than the right, but free from redness. The region below the left mastoid in front of the sterno-mastoid muscle is especially painful to the touch. Discharge of foul-smelling pus from the left ear. Temp. 105° F., (see chart) pulse 120, respiration 40 to 45. When the pupils were dilated a marked choked disc was readily seen in both eyes. No hemianopsia, no photophobia. Auscultation and percussion negative.

JOSIE KRAFTEN, aet. 10.

Chron. Otitis. Sinus Thrombosis. Pyæmic Pneumonia.



The history and symptoms clearly indicating otogenous pyæmia from thrombosis of the left lateral sinus with pulmonary affection, operative interference was decided on and consented to by the mother the next day.

January 9, 1898, operation.—After the side of the head adjacent to the left ear had been extensively shaved and the surroundings of the ear sterilized with soap and ether, and the child etherized, a large curved incision above and behind, close to the auricle, was made down to the bone, followed by another from the vicinity of the upper end of the first about 2.5 cm backward.

The entire surface of the mastoid was bared, the posterior and upper border of the ear canal exposed, the soft wall of the meatus detached from the bony wall and held applied to the anterior wall with a tenaculum. The mastoid near the canal was chiselled away, together with the posterior bony wall, until the antrum was reached. The antrum was very deep and surrounded by dense ivory bone. A bent probe was introduced into the aditus and upon it the overlying bone removed by careful chiselling until the attic was reached. The latter was cleansed with a sharp spoon. The ossicles were absent.

The wound was then extended by chiselling the bone in a backward direction. At a depth of 3 to 4 mm the lateral sinus was reached. It was deep-black and plainly pulsating. The opening was enlarged with chisel and bone forceps until it had a diameter of 2 cm each way. In the upper part of the opening thickened dura mater was visible. With a hypodermic syringe a small quantity of the contents of the sinus was withdrawn. It was dark blood without odor.

The ridge of bone between the sinus and antrum was chiselled away, the wound cavity tamponed with sterilized gauze, and the child put to bed. In the evening, when she came out of the ether, she was perfectly rational and complained only of pain in the wound. 10 P.M., temp. 101.5°.

January 10th.—Mother states that the child was delirious during the night, but slept well after taking a morphia powder. The child answers questions, but is very weak. Temp. 105°, pulse 140, resp. 45. In the afternoon she rallied, was brighter, and took a cup of milk. Evening temp. 105.5°, pulse 130, resp. 40. The child coughed now and then.

January 11th.—Slightly weaker, had a fair night. Temp. 105.2°, pulse 145, resp. 45. Having had no passage for three days, received an enema which brought several hard lumps of fæces. Optic neuritis marked. No pain, slight cough. Wound dressed; no secretion or swelling, but sinus discolored.

January 12th.—Patient was so weak and drowsy that she was not expected to live through the day. Temp. 105°. Cough worse. No swelling or tenderness below ear or along sterno-mastoid muscle.

January 13th.—Patient was so much better that the dressing was changed again. *A large portion of necrosed sinus and contents with gangrenous odor were removed.* Fresh blood came from

above, not from below. Cough. Pain in back. Child still answered questions when aroused, but was very weak and lay with her eyes closed. Temperature, which the evening before had fallen to 103° , rose again to 105° in the evening. Pain in back increased. Optic discs grayish-white, swollen, veins greatly engorged, some hemorrhages at periphery of discs.

January 14th.—Wound dressed. No material change in condition of child. Cough increasing and more distressing. Temperature 105° in the morning, 104° at noon, 105° in the evening. Respiration rapid and laborious.

January 15th.—Child very weak. Temperature 105.3° , pulse 145, respiration 45. Coughed a great deal. Became steadily weaker during the day, and died at 7 P.M., never having lost consciousness until shortly before death.

Autopsy.—Only the head and neck were allowed to be examined. On removing the rachitic skullcap, normal dura was exposed, under which dilated veins were seen. On the under surface of the cerebellum there was a small amount of serous exudation with some coagulated masses. The sinuses were filled with dark blood. The sigmoid sinus was destroyed. The jugular bulb was filled with a dirty whitish-yellow clot, which, toward the beginning of the vein, gradually contracted, adhering to the wall. Immediately below the clot, the jugular vein was empty, with smooth walls, and normal calibre, but thence it rapidly contracted to a narrow tube with an even diameter of 2 or 3 mm down the whole length of the neck. The walls of the tube had the thickness of an arterial vessel of the same calibre, its inner surface was smooth, but the lumen was interrupted by round, grayish pellets at intervals of 2 to 2.5 cm, adherent to the walls of the vein. They had the appearance of coagulated fibrine.

Remarks.—A delicate child, had intermittent otorrhœa almost all her life, was brought to the hospital in a very low condition from an otogenous pyæmic pneumonia. A radical operation was done, the sigmoid sinus exposed, and on puncturing dark blood without odor was withdrawn. Child better the next day, worse the day after, when at the dressing a large portion of necrosed sinus and gangrenous, offensive contents were removed. Death two days later, on the 7th day after admission to the hospital, on the twenty-second after the last (fatal) relapse of otitis. The autopsy of the

head and neck revealed infective thrombosis of the lateral sinus, extending into the bulb of the jugular vein, which it occluded at its lower end by a dense, not disintegrated clot.

A remarkable feature of the case was *the shrinkage and the complete emptiness of the internal jugular vein*. The vein resembled a thin, empty artery of 2 or 3 mm in thickness. When slit open, pellets of coagulated fibrine were found in its whole length at an interval of about 2 cm. The inner wall of the vessel was smooth and free from odor. I suppose that the occluding clot had formed when a sufficient quantity of the infective material had penetrated from the sinus and bulb into the circulation to cause the lethal issue by pyæmic pneumonia. Two days before her death, when a portion of the lateral sinus was removed, fresh blood came from above not from below. At no time, as long as the child was at the hospital, was there any hardness felt along the anterior edge of the sterno-mastoid muscle. Had I attempted to ligate the internal jugular it would have been a failure, for in the autopsy I had the greatest trouble to find the vein, and could only identify it when I followed the thin, apparently arterial, cord up into the bulb, where it suddenly broadened and revealed its character.

CASE 2.—Otitic sinus thrombosis. Multiple metastatic arthritis. Several ear and sinus operations. Recovery.

On July 1, 1898, Dr. F. P. Lewis of Buffalo brought to my office Mr. Sh. Colman, æt. eighteen, of Dunkirk, N. Y., and kindly gave me the following notes on the patient's previous **History**: "In January, 1894, S. C. came under my care, stating that he had occasionally had severe attacks of earache, as far back as he can remember. He had for some years been under the care of an otologist, who several times removed growths from the ear. On examination I found excessive granulations occluding the mouth of a fistula extending upward and backward, apparently into the antrum. The granulations being rooted out, the channel was traced back into an apparently closed cavity. The boy was anæsthetized and the necrosed tissue removed through the external-ear canal by scraping the cavity with a sharp spoon. This gave relief for nearly a year, when an opening had formed at the site of the former fistula. The cavity was again

scraped, but this time the discharge was controlled for only about six weeks. Very great prostration followed this apparently simple operation, temperature for several days being subnormal, about 97° F. Previous to the last recurrence of the discharge he had for several days been bathing in Lake Erie, getting the cold water into his ears. After this time he went away to school for a year, having the ear treated with injections of nitrate of silver.

"In April, 1898, he returned with a much worse condition of the ear than ever before. The discharge was profuse and offensive, and there were exuberant granulations at the opening of the fistula. A more thorough operation was, therefore, immediately determined upon and performed within a few days. The mastoid was opened freely and a necrotic cavity discovered, which was chiselled clean. The posterior wall of the ear canal was taken away, and the lining dermal tube slit and spread out over the newly made cavity. The operation was done with strict antiseptic precautions, and the dressing not removed for five days. At the end of that time the dressing was found dry and free from odor. Very slight rise of temperature passed quickly. The restorative process went on uninterruptedly for two months, at which time the wound had almost closed, only a fistulous sinus remaining, but soon the edges of the wound assumed a bluish, unhealthy look. The glands of the neck became swollen and hard, and the patient felt generally ill. The wound was again opened and found to lead into a carious channel extending deep into the substance of the bone. It then became evident that a very extensive operation would be required, possibly imperilling the lad's life, and further counsel was sought and obtained."

A detailed description of the **condition on admission** to the hospital **and the operation** is contained in a paper published in the ARCHIVES OF OTOTOLOGY, vol. xxvii., p. 329, to serve to illustrate methods of the functional examination of the ear. I shall here mention the condition only briefly. A large granulating wound, reaching high up, was found in the mastoid. Membr. tymp. gone. Granulations and bare bone felt at the bottom of the middle ear. The probe passed under the lateral wall of the attic and considerably backward. Temperature, 100°; headache, dizziness. The left ear healthy. The right was totally deaf, as proven by the tests of Dennert, Weber, and the present writer (ARCH. OTOL., *l. c.*, p. 327). There was no facial paralysis, no

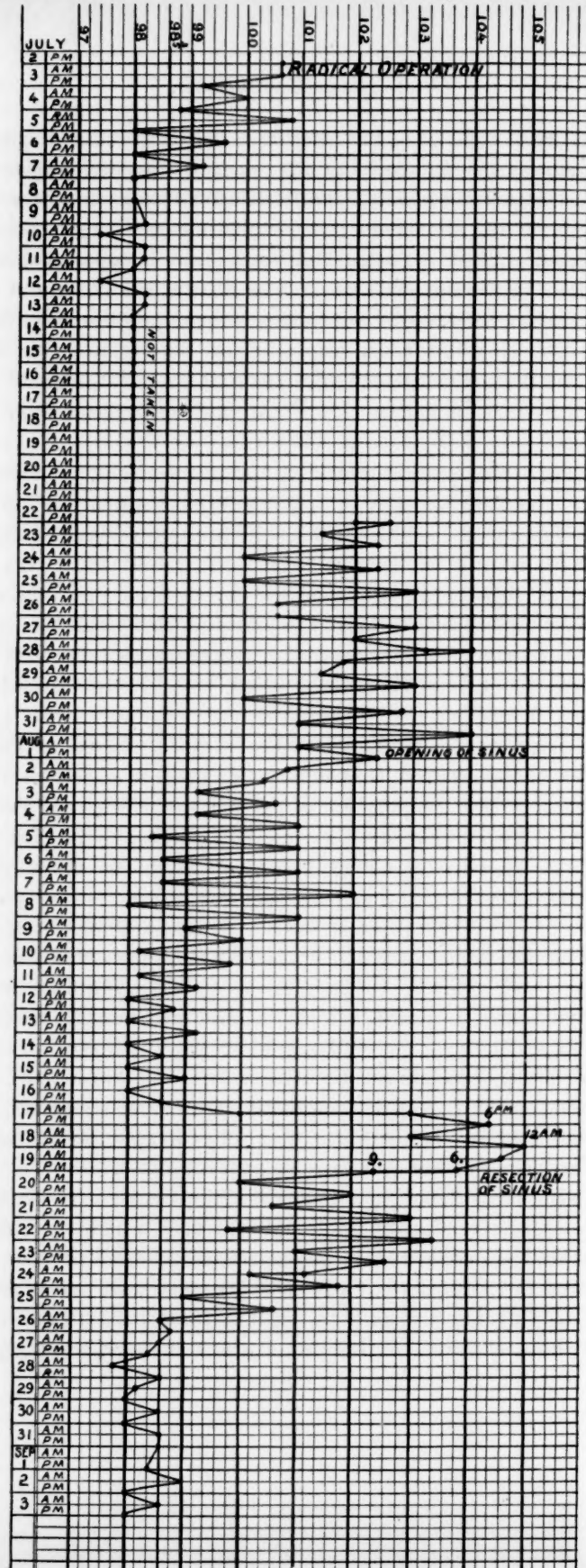
abnormality of sight or of the interior of the eyes. The diagnosis was: *extensive chronic caries of the mastoid, attic, and tympanum, extending into the labyrinth.* A **radical operation** was performed July 2d, removing all carious bone, including both larger ossicles, the external wall of the attic, and the posterior wall of the mastoid, exposing the sigmoid sinus. The dura at the bottom of the middle cranial fossa, laid bare by a previous operation, was lined with a grayish-white coat, imposing for cholesteatoma. The wound cavity in the mastoid was covered with the flaps of the split soft wall of the ear canal. Dressing with aseptic gauze.

Course.—The patient did well for three weeks. The temperature, 100.6° at the day of the operation, sank to 99° on the next day, to 98° at the third, then, with a slight feeling of chilliness rose abruptly to 100.8° on the fourth, sank to 98° on the fifth, varied slightly above and below 98° until the twentieth day, when, with more pronounced chilliness, it suddenly rose to 102.6° , then showed steep elevations and depressions between 100° and 103° until the twenty-sixth day, when, with another attack of chilliness, it reached 104° , falling the next morning to 100° ; the twenty-eighth the difference was less, but on the twenty-ninth day after the operation it rose to 104° again and fell to 101° . This characteristic temperature of pyæmia (see the chart) was accompanied by a pulse varying from 66 and 124, by regular and easy breathing, without cough, but by pains in the limbs, pains and stiffness and swelling in various joints of both sides, apathy, total loss of appetite, nausea, at times vomiting and dizziness, dullness. The percussion tone of the spleen was slightly enlarged, the skin warm and moist, no distinct chills or sweats, fundi oculorum normal; one day, July 26th, urine 1% of albumen, later traces only; wound looked well; slight tenderness over the upper portion of the jugular vein; head all the time clear and free from pain. In the latter part of July, the temperature was most abnormal, and the joints most swollen, stiff, and painful; the appetite was somewhat restored, and the bowels were relieved daily.

The symptoms denoting a clear case of pyæmia with articular metastases, but freedom of lungs and meninges, a **new operation** was decided on, consented to by the patient and his brother, and performed on August 1st, under the presence and assistance of Dr. Lewis. Previous wound enlarged to tip of mastoid and horizontally backward in the direction of the transverse sinus 3.5 cm.

MR. SHIRLEY COLEMAN, aet. 18.

Sinus Thrombosis. Articular Metastases. Several Operations. Recovery.



All the parts of the tip were chiselled away, with the exception of the medial table, which appeared healthy, whereas the internal parts were diploic, congested, and easily broken down, but not necrosed. The lateral sinus was laid bare to the extent of 4 cm in the vertical and 2.5 in the horizontal direction, toward the torcular. It looked blue and felt soft. In attempting to enlarge the wound in a backward direction with a rongeur, the sinus was accidentally injured, letting dark, fluid, inodorous blood escape. The bleeding was easily stopped by tamponing with aseptic gauze. A part of the sinus, adherent to the scab from the previous operation, appeared thickened, and was split with a Graefe knife. Dark fluid blood escaped. *The wall proved thickened as from adherent fibrous tissue*, but nothing of the thickened tissue could be scraped off with a sharp spoon. On compressing the upper part of the sigmoid sinus, a moderate flow of blood came from below, whereas on pressing on the lower part blood flowed freely from above. The wound was plugged with aseptic gauze. The temperature sank at once, and remained normal from the tenth to the sixteenth day after the operation. Patient felt well, but the swelling and painfulness, wandering from one joint to another, being most pronounced in the shoulders and wrists, continued. Dressing first changed on the fifth day. Wound looks healthy. The sinus is hard, evidently containing a thrombus. The background of both eyes shows dark, enlarged, and tortuous veins, and beginning of choked disc. In the region of the internal jugular down the neck, neither swelling nor tenderness. Up to the sixteenth day general condition good, joints the same, rather improved. Distinct choked disc in both eyes on the twelfth day. The sinus lay as a slightly swollen red mass in the centre of the healthy wound. It has a solid, fleshy feel, without pulsation. The right side of the head along the track of the transverse portion of the lateral sinus, from the upper knee of the sigmoid to the torcular of Herophilus, was distinctly tender on pressure. With this exception, which indicated the existence of thrombophlebitis, the case looked satisfactory.

August 12th.—Dr. Fred. Whiting saw the patient with me, in consultation. We both were of the opinion that for the present no other operation nor any change of treatment was called for, but if there should be an aggravation of the symptoms pointing toward thrombosis, the transverse sinus should be exposed, opened, and cleansed. With this conclusion I gave the treat-

ment of the patient into the hands of my son (Arnold H.), myself to spend a two weeks' vacation in Eastern Canada.

August 17th.—Patient did beautifully until to-day, when the temperature rose to 103° at 5 P.M., to 105° at 10 P.M., pulse 120. Optic discs markedly swollen, great prostration, chilliness, insomnia, vomiting, headache, pain in joints. The patient's brother had been informed of the necessity of another operation; Dr. Lewis, telegraphed for, had arrived.

August 18th.—Temperature, 105° . **Operation** (by Dr. A. H. K.). Ether. The granulations on the sinus were scraped away; free bleeding. Sinus wall exposed. At the upper end and back part the sinus showed a distinct yellowish purulent spot. The transverse sinus exposed backward for 2.5 cm. The sinus was then opened throughout its exposed portion, about 7 cm ($2\frac{1}{2}$ in.). In the vertical part the wall was thickened, and on the inner side covered with granulations. No bleeding and no pus. On opening the sinus farther back free hemorrhage took place from the petrosal and lateral sinuses, which were plugged. Then the vertical part of the sinus at the lower end of the wound was exposed and opened; no hemorrhage. At that time the patient's condition became so bad—face pale, respiration poor, almost no pulse—that the operator immediately proceeded to infuse a litre of salt solution into the vein of the arm. The pulse improved, but the general condition did not permit of further operating. He was hurried to bed, had a distinct chill, with rapid respiration. His condition was very critical until 9 P.M. when he began to rally. Stimulation was kept up all night, and in the morning his temperature was 100° , his pulse 110, and of a fair quality. In the evening of August 19th he was in good spirits though weak, and very thirsty all day. Pulse and temperature are the same (see chart). "I think he will now get over the effect of the operation," my son wrote me, "but whether we have gotten at the root of the trouble is another question." (The operation was done in the operating-room of the New York Ophthalmic and Aural Institute, assisted by Drs. F. P. Lewis, Edwin Cox, the house-surgeon, I. Ledermann, and others.)

August 26th.—Patient has gradually gained strength. The temperature, 103° after the operation, has gradually fallen to normal (see chart). Pulse, 90. Has suffered great pain in joints of right wrist and left shoulder and ankle. Steady improvement. Wound granulating well. Optic discs and adjacent retinae still

swollen and whitish-gray, veins uniformly dark and tortuous (engorged, not thrombosed), some hemorrhages at the periphery of the optic disc. In the centre of the wound there is an evenly hemispherical, pulsating elevation, the exposed surface of the sigmoid sinus. The skin of the fourth and fifth fingers of the right hand is numb—anæsthesia of ulnar nerve.

September 16th.—All the symptoms steadily improving. The gradual diminution of the choked discs has been very interesting and gratifying to watch. Wound healing rapidly. The skin behind the sigmoid sinus, where the portion of the transverse sinus had been removed, was raised and swollen after the last operation, bridging over a recess from which a small quantity of pus escaped on pressure.

September 22d.—From this fistulous recess a small piece of loose bone was removed with a sharp curette.

September 28th.—Discharged from hospital. Wound has healed perfectly with the exception of the fistula, from which still a drop of pus exudes daily. The middle-ear cavity dry. Optic neuritis but little pronounced. Acuteness and field of vision normal. The patient's general condition remarkably improved. He has gained flesh; his functions are normal. He feels the pleasure of convalescence.

Dr. Lewis, under whose care he returned, has kindly kept me informed of his condition, which was fast advancing to perfect restoration with the exception that the subcutaneous fistula was slow in closing. November 18, 1898, it was about $\frac{1}{2}$ inch in depth; the probe touched bare bone which was neither movable nor did it seem necrosed.

Nov. 21, 1898. Patient seen to-day. Health good. The wound healed; a portion in its centre is yielding, lacking the support of bone. The fistula is 1.5 cm. deep, smooth everywhere, apparently closing up. The introduction of aseptic gauze to be replaced by the insertion of a perforated silver tube, until the healing from the bottom of its closure is completed. The optic discs by a slight haze or venous congestion still indicate the former presence of optic neuritis; no atrophy; sight normal.

Dr. Lewis informed me in May, 1899, that the fistula had permanently closed by the end of December, and that the patient had resumed his studies and enjoyed good health.

Remarks.—The history of the preceding case is long and

the patient had to submit to 5 or 6 surgical interferences, yet he made a perfect recovery. Both the number of operations and the happy issue depended greatly on the nature of the affection. It is well known that sinus thrombosis which prevalently shows articular metastases gives a better prognosis than thrombosis with pulmonary metastases. The milder and more protracted symptoms of the former do not prompt the surgeon to resort to so quick and radical treatment as when he has to deal with the latter. In the above case the symptoms slowly and by jumps developed to a high degree of danger, requiring as extensive operating as if it had been a freely infective thrombosis, yet there never appeared an involvement of the internal jugular. The lateral position and the fibrous nature of the clot, peculiar to the cases of articular metastases, manifested itself distinctly in the last operation but one. The phlebitis of the transverse portions could, however, soon be made out by the painfulness on pressure along the course of the transverse sinus, and foreshadowed already the probable necessity of another operation, which chills and a sudden rise of temperature in a week made inevitable. On exposing the transverse portion a puriform thrombus was found and removed with a portion of the sinus. This was the beginning of the recovery, which was slow, but steady and complete. During the severer period of the disease the onset, increase, and decline of the toxic condition of the blood could be ophthalmoscopically followed by watching the accompanying neuro-retinitis in both eyes.

THE MAGNIFIER IN OTOSCOPY.

By DR. GEORGE BOENNINGHAUS, BRESLAU.

Translated by Dr. C. M. CULVER, Albany.

A CERTAIN risk is run in asking renewed attention to a matter that has lain for years in the garret of science, forgotten by the elders and unknown to the younger, of which the value or worthlessness has not been finally settled but whose place in attention has been usurped by matters of present interest. The conviction, however, that the old thing is a good one, gives me courage to seek to bring under consideration the examination of the tympanic membrane and its immediate environment by the aid of a magnifier.

The first question to present itself is this: IS IT WORTH WHILE TO EXAMINE THE PARTS, ABOVE MENTIONED, OF THE EAR, UNDER MORE FAVORABLE CIRCUMSTANCES THAN ARE POSSIBLE WITH THE UNAIDED EYE? In view of the smallness of the parts in question and their frequently minute changes, this question can hardly be answered negatively. The otologists who have invented instruments for magnifying the images of the drum membrane have done so certainly because they found the unaided eye inadequate to this purpose. The testimony of the otologists who have represented best, in pictures, the tympanic membrane—those who have made the atlases—is certainly most trustworthy in this connection. The artist and painter can of course represent exactly only what they have seen exactly. Politzer says, in his atlas: "Heretofore, less significance has been ascribed to the diagnostic importance of enlarging

images of the drum membrane than belongs to it as a matter of fact. By the use of proper magnifying apparatus it is possible to bring to notice, with surprising clearness, a number of minute details, which in ordinary examination escape attention." And Buerkner¹ says, in Schwartz's *Handbuch*:

"Among other things it is desirable, in order to observe fine changes in the tympanic membrane, to enlarge the image of it."

What is so advantageous to the practised eye of the master must be much more serviceable to the novice! When I began, ten years ago, to busy myself with otology, although I examined and treated the considerable number of ear cases of the Augusta Hospital, many a picture of the membrane remained indistinct to me, in spite of the best intentions on my part, because I had brought from the university only a general notion of the appearance of the tympanic membrane. In this need, I made use of the magnifying lens, after the method of its use with the ophthalmoscope, when examining the inverted image, saying to myself: "If this method is so useful when examining and studying corneal changes, why may it not be equally so when the object of examination is the drum membrane?" I remembered that foreign bodies and minute vessels that might escape the notice of the experienced oculist, were, with the magnifier so used, evident to the veriest beginner. And behold! it worked excellently for the drum membrane.

If the question already asked must be affirmatively answered, what shall we do with the next, viz.: *Why, then, has the magnifier so few friends?* For, so far as I can learn, the loupe is, at least in Germany, scarcely at all used as above suggested, and is usually regarded as a superfluous instrument. As quite separate from the ear speculum, Cleland used it in 1741 and Delean in 1823. As regards the later instrument, in which the convex lens was attached to the ear speculum in some way, the answer is easier than when the

¹ The pertinent literature not mentioned in the text is summarized by Buerkner in the thirteenth chapter of Schwartz's *Handbuch*. Besides that, the author has consulted the text-books of Hartmann, Jackson, Politzer, Schwartz, and Urbantschitsch, and Politzer's and Buerkner's atlases.

reference is to the detached lens, since these combined instruments are inconvenient for practical use. Since the separate lens and speculum are, as Buerkner remarks, in many points superior to any of their combinations, it seems only a matter of wonder that any of the combined instruments should have been devised. The probable explanation of their invention is that those who used them were not accustomed to hold the reflector by the head but held it with one hand, hence had only the other, single hand with which to hold both speculum and magnifier.

Before entering upon a discussion of the details of the use of the loupe, let me venture the suggestion that whoever will interest himself in this matter shall not seek the aid of a text-book on physics and its formulas, but shall take the loupe itself and any book he pleases, and prove what can be done by magnifying the print itself.

Now if one looks at the print, by daylight or lamplight, with a loupe of three inches' focal distance,—the strength that, as will be shown further on, is most suitable in otoscopy,—when the lens is less than three inches from the print, the latter is seen magnified in its erect image. The magnification diminishes as the lens is approximated to the print, increases as the lens is withdrawn from the print, and when the two are so far apart that the image is more than its focal distance from the lens, the image becomes indistinct, and is finally inverted. When the observer's eye is near the magnifier, a whole page of the book is visible to it; when farther away, only a few letters can be seen. But aside from this diminution of the field of vision, no other change occurs, for the magnification which one thinks one perceives when the distance between the observing eye and the lens is greater, is only apparent and produced by the fact that the few letters seen when the eye is farther from the lens are estimated, because they fill the whole area of the lens, as larger than the many letters seen when the observing eye is nearer the loupe.

Brunton's otoscope, which has the magnifier without the forehead reflector, is constructed according to this principle. This apparatus renders good service, and Voltolini was

so pleased with it that he had the speculum made air-tight, provided it with another side-opening, and produced the pneumatic speculum. With the usual reflector employed in otoscopy, having a focal distance of ten to fifteen centimetres, let the light be thrown on the print and the head held so that the print is most brightly illuminated. If the magnifier be now held within its focal distance between the reflector and print, the latter is seen not only magnified but most intensely illuminated, much more than is possible with the reflector alone, since the light-collecting power of the lens is added to that of the reflector. Reference to the good quality of the magnifier of intensifying the illumination, is as little found by me in otologic literature as are others of its good qualities which are to be discussed later. It was according to this principle that Weber-Liel devised his otoscope in 1863, in which the magnifier was held near the outer opening of the ear speculum by the horizontal rod. Trautmann modified this in 1873, doing away with the rod and having the biconvex lens screwed on the proximal end of the speculum, and, to avoid reflexes from the loupe, somewhat obliquely to the axis of the speculum. Auerbach seems to have changed it somewhat again in 1876, when he exhibited his form of it to the meeting of natural historians at Hamburg: the transactions are not accessible to me. Rossi described a similar device in 1896.

All fixed magnifiers are less valuable for use than are those that can be moved from side to side, and for that reason.

Next comes to attention parallaxic movement, which is used in measuring the depth of excavation of the optic nerve disc: this is equally applicable for the use of the magnifier in otoscopy. By this means it is easy, for instance, to estimate the distance of the edge of a perforation from the promontory.

A further advantage of the magnifier is its prismatic effect, which enables us to practically see around a corner. This quality is used in ophthalmoscopy, likewise, to bring parts of the ocular fundus into the observer's field of vision from behind the pupillary edge of the examined eye. In order to study this appearance, two pages of the book should be held

with a short interval between so that the upper edge of the nearer page shall just hide the upper edge of the farther. If the nearer page be regarded through the magnifier, not through its middle but its upper half, the farther page is also seen, and more of it in proportion as one looks through the magnifier nearer its edge. If it were sought to do all this with the apparatus in looking at the tympanic membrane, it would be requiring of the magnifier an impossibility, because of the intervention of the external auditory canal; still, with the proper use of the prismatic qualities of the lens, it is possible, sometimes to see through a perforation of the tympanic membrane, and study even the finest details of the fenestrum ovalis, which without its aid might have entirely escaped attention.

To recapitulate the advantages which the combination of the magnifier and reflector have over the use of the latter alone: Enlargement of the image of the tympanic membrane, stronger illumination of the same generally and especially of its extreme edges (prismatic effect), and bringing out more clearly of the dimension of depth (parallactic shifting). The focal distance of magnifier for use in otoscopy has certain limits; if the length of the auditory canal be estimated as $2\frac{1}{2}$ cm, and the length of that part of the speculum which is outside the canal likewise $2\frac{1}{2}$ cm, then the lens may be used conveniently at a distance of about six centimetres from the tympanic membrane. Inasmuch as a convex lens enlarges the erect image when the object viewed is within its focal distance, so a lens must be chosen whose focal distance is more than six centimetres. It must not be of greater, either, else will the magnification and illumination be too weak. Heretofore I have uniformly used a lens $7\frac{1}{2}$ cm focal distance, that is of 13 dioptries, which, when using the reflector, produces a magnification of about $2\frac{1}{2}$ times, according to Trautmann. The most acute glass that can be used is one of about $6\frac{1}{2}$ cm focal distance, or 15 dioptries, which produces a magnification of about $3\frac{1}{2}$ times. It is, however, more practical to choose that of $7\frac{1}{2}$ cm focal distance, since it admits of greater distance between itself and the speculum, and is moreover usually furnished with the

ophthalmoscope, hence the practising ophthalmoscopist has one, and the general practitioner likewise, if he uses the ophthalmoscope at all, and it is not necessary to get an extra lens. The most convenient form for otoscopy is a lens framed in gutta percha with a small handle, such as is found in the case of Liebreich's ophthalmoscope. The method of use of the lens is very simple. It is quite a customary method. It is also necessary in using it that hyperopes and presbyopes, as well as those having a high degree of myopia, shall have the proper correcting glass behind the aperture in the reflector; then the magnifier is held with the free hand about a centimetre from the trumpet end of the speculum. If reflections from the magnifier are still troublesome, they are disposed of by holding the magnifier somewhat obliquely to the axis of the speculum.

In order not to be misunderstood, I would like to adduce a few examples of cases in which the magnifier is to be chosen, and some in which it is not to be chosen. It is not adapted for the examination of great surfaces. The beginning of an examination should be made without it. When we care to view single points especially, the loupe becomes useful. The magnifier triumphs especially in the study of perforations. Differentiating between perforations and scars, in cases of strong retraction of the membrane, is much aided by the magnifier. Examples of the applicability of the magnifier in otoscopy could be readily multiplied.

The question of doing finer operations on the tympanic membrane with the aid of the magnifier now presents itself. There is nothing to hinder this; only there must be enough room through which to introduce the angularly bent instruments. Voltolini arranged the Brunton magnifier so that this was possible, and Dundas Grant, according to Politzer, uses a divided speculum, somewhat like the Weber-Liel otoscope. I believe that Grant's form of the operation-speculum is very advantageous; at least one disadvantage is disposed of, which the simple magnifier has in operations, which consists in the fact that a second person is necessary for the holding of the ear speculum. At the same time, to dispense with an aid oftentimes leads to regrettable consequences. I believe

that in many cases the simple convex lens of $7\frac{1}{2}$ cm focal distance is advantageously applicable in otoscopy. The advantage of its use will indeed be less for the experienced otologist, yet such a one will often find cases in which the magnifier will seem to him indispensable. On the other hand, the facility which the use of the magnifier assures to the novice is so great that, when instruction in otoscopy is begun, this apparatus ought certainly to be recommended to him. Things that he cannot see without the loupe he certainly oftentimes can see with it.

A CONTRIBUTION TO THE STATISTICS OF THE
DANGEROUS COMPLICATIONS OF SUPPURATIVE
EAR DISEASES AND OF OPERATIONS ON THE
MASTOID PROCESS.

BY DR. M. TEICHMANN, BERLIN.

Translated and abridged by Dr. JULIUS WOLFF, New York.

THE object of the following statistical reports is to draw attention to several hitherto insufficiently considered points, which may have a causative relation to the dangerous complications of suppurative ear disease, and, therefore, may at times demand consideration in the attempts to avoid these complications. The figures are drawn from the official returns made by the hospitals to the Bureau of Statistics of Prussia, and the following three groups of cases are used as a basis:

- A. 709 cases of operation on the mastoid process during the year 1894.
- B. 930 cases of operation on the mastoid process during the year 1895.
- C. 111 deaths from complications of suppurative ear disease during the years 1893-1895 (without operation).

It is very much to be regretted that, owing to defective filling out of the statistical blanks, the information derived was far less than expected. But even this incomplete material suffices to show from what different points of view such cases can be grouped.

Of the total 1750 cases included in groups A, B, and C, 62.1 % were males and 37.9 % females. These figures correspond to the participation of the two sexes in suppurative diseases of the ear and temporal bone in general.

In calculating the distribution of cases to the various ages, the following periods of life are differentiated:

From 0-1 year: infancy.

" 2-5 years: early childhood, rich in infectious diseases.

" 6-14 years: school-days.

" 15-20 years: puberty.

" 21-30 years: early manhood.

" 31-50 years: ripe manhood.

" 51-70 years: period of senile changes.

Above 70 years: extreme old age.

It has been found that *more than half of the cases* (56.6 %) *belong to the periods from 6 to 30 years*, while 71.8 % belong to the years 0 to 30.

In computing the frequency with which each ear participated in the dangerous complications, unfortunately the returns of the year 1895 only were considered. Of 462 complications (operations and deaths without operation), 207 (= 44.8 %) affected the left, 229 (= 49.6 %) the right, and 26 (= 5.6 %) both ears. No importance must be attached to the apparent preponderance of the right side, as the number of cases is too small.

In only 665 of the whole number of cases the returns stated whether the suppuration was acute or chronic. Out of this number 24.9 % were acute and 75.1 % were chronic. *From this it may be assumed that about three quarters of the dangerous complications follow chronic purulent otitis, and only one quarter the acute.* As only 16 cases of group C are included in the above 665, the number is too small to permit any conclusions to be drawn in regard to the mortality in acute and chronic cases without operations.

The *cause* for the suppuration underlying the dangerous complications was mentioned in 236 cases. Scarlet-fever was named in 29.2 %, influenza in 17.8 %, scrofula and tuberculosis in 16.1 %, diphtheria in 10.6 %, measles in 8.0 %, and colds, typhoid, syphilis, whooping-cough, trauma, and various other diseases in the remaining 18.3 %. Thus it will be seen that the acute infectious diseases of childhood (scarlet-fever, measles, diphtheria, and whooping-cough), with scarlet-fever leading, are the cause of the primary suppuration of the ear in almost half of the cases (48.7 %).

The figures were too small to allow positive conclusions to be drawn in regard to the relation of the various causes of the primary ear trouble to the course of the suppuration up to the time of the complication. But so much may be said, that the suppuration in influenza-otitis almost always runs an acute course up to the inception of the dangerous complication, while in the otitis of scrofula and tuberculosis, diphtheria and measles, it runs a chronic course.

The main interest in the gathering of these statistics centers in the question whether some occupations may exert a harmful influence on the occurrence of dangerous complications in suppurative ear disease. A tabulation of the cases according to the occupation of the patients shows a marked preponderance of certain industries. The ones that contribute more than the average of cases are the farming and metal industries, the tradespeople, officials, builders, wood-workers, domestics, and the textile industries. It must be remembered, however, that chance may play an important part here. Only if the number of those suffering from suppuration of the ear in each industry were known, we could form a judgment in regard to the tendency towards complications in each one.

By making use of the figures of the industrial census for 1895 I have computed the relation of the above cases and deaths to the total number of persons employed in each occupation. The results show again the greater participation of the metal, textile, and wood industries, the tradespeople, domestics, and officials; for to each 10,000 persons in these occupations there are from 0.89 to 3.70 individuals with the suppurative ear disease and complications. On the other hand the farming and building industries this time fall far below the average, whereas the sedentary occupations requiring much writing here contribute twice as many cases as the average.

This brings us to the question whether *social position* exerts any influence in the developement of dangerous complications after ear suppuration. At first thought one would be inclined to suppose that those of lower social position would pay less attention to their ailing and hence be more

subject to the complications than those better situated. The figures, however, do not substantiate this, for those who have an independent position show as large a percentage as the skilled laborers and twice as large a percentage as the day-laborers and domestics. These data prove the old experience that the significance of ear suppuration in respect to health and life is still underestimated even in the so-called better classes.

Finally the results of the operations performed in groups A and B remain to be reported. Of the 1639 operations, 154 ended fatally, 8 of them, however, from causes not connected with the operation. The average mortality for the various periods of life as subdivided above was 8.9%, the largest percentages of deaths belonging to the periods 0-1 year and 51-70 years with over 15% each.

In only 66 of these 146 deaths it could be ascertained whether the suppuration had been acute or chronic, namely 12 times (=18.2%) acute and 54 times (=81.8%) chronic. All these figures are, however, too small to determine the greater or less effectiveness of the operation or its dangers in various periods of life. Still it may be stated that of 37 operated cases of tuberculous ear suppuration, 5 (=13.5%) died, while of 65 operations for scarlatinous suppuration only 3 (=4.6%) died.

The foregoing statistics simply indicate with what practical points in view a carefully recorded material can be made use of, and if this stimulus given to aurists and hospitals shall fall on fertile soil, a new consideration of the questions here brought out will after several years doubtless be productive of better results.

PERCUSSION OF THE MASTOID PROCESS.

BY DR. H. EULENSTEIN, FRANKFURT-A.-M.

Translated and abridged by ADOLPH O. PFINGST, M.D., Louisville, Ky.

WHEN Michael (1), in 1876, came to the conclusion that no information could be elicited by percussion as to the condition of the mastoid, because of the resonance of the buccal cavity, he was under the impression that the difference in the percussion sound was dependent upon the size and condition of the pneumatic spaces of the bone. His examinations were all made upon healthy mastoids.

Wild and Körner (2) have since then (eighteen years later) shown by experiments upon the cadaver that variations in the percussion sound occur independent of the air cells, and are often due to disease of the bone substance. Based upon two cases, in which the conditions were confirmed by subsequent operations, they ventured to establish the maxim that "it is sometimes possible by bone percussion, according to Lücke, to diagnosticate acute central otitis of the mastoid at a time prior to other manifestations of the trouble." Wild (3) subsequently published another case in support of this view. While substantiating the views of Wild and Körner, Moos (4) made the point that percussion was of value only when it gave positive results, or, in other words, that disease of the bone could exist without altering the character of the percussion note. In 1894 (5) I published the results of the examination of ten cases of acute disease of the mastoid, in which I arrived at the following conclusions:

I. By means of percussion (compared with that of the

other side) a positive diagnosis of a diseased condition of the mastoid can be made—provided dulness is elicited.

II. Dulness on percussion indicates the presence of a diseased area near the surface of the bone, the degree of dulness depending upon the extent of the area involved.

III. The absence of dulness is no proof that the bone is not diseased.

IV. Where other symptoms of mastoid disease are present and there is no dulness on percussion it indicates that the diseased area is either very small or deep-seated.

Haug (6), and in fact all of the late investigators, with the single exception of Weygandt (7), have substantiated these results. The latter discredited the value of this method of diagnosis entirely, because, as he says, "dulness is often wanting in inflammation of the mastoid, while it may be present in a number of other affections of the bone." If the change in the percussion note were our only means of diagnosis, this argument of Weygandt might be considered, but it stands to reason that this is but an auxiliary to the subjective and objective symptoms. We could as well say that the dulness on percussion in pneumonia was of no diagnostic value, simply because it also occurs in a variety of other affections.

In summing up the result of his research, Weygandt says that *marked* dulness was present, (a) always in abscess of the middle ear with perforation of the drum and pus sufficiently abundant to fill the tympanum and external ear canal; (b) in a girl, eleven years old, upon whom a mastoid operation had been performed two years previously, and in whom an indrawn scar showed the absence of pneumatic cells; (c) in complete occlusion of the external ear canal by cerumen, foreign bodies, furunculosis, tumors, etc.; (d) and in tumors of the middle ear.

As these results are contradictory, little value can be attached to them in determining the worth of percussion in the diagnosis of mastoid disease. If, for instance, dulness was marked in every case of suppurative middle ear in which the tympanum and ear canal was filled with pus, this must, according to his other conclusion (c), be due to the

occlusion of the ear canal by pus, and not merely, as Weygandt suggests, to the middle-ear abscess. In a number of such cases which I examined after cleansing the ear canal and tympanum of pus, dulness was never present, a fact also noted by Wild and Körner. In the case of a depressed scar after operation, mentioned by Weygandt (*b*), the new dense connective tissue which replaced the bone accounts for the dulness, and not, as he thought, the absence of air cells. As to the presence of occluding substances in the ear canal, even should we concede that they cause dulness on percussion of the mastoid, they could readily be recognized by simple methods of examination and be removed. Certainly no one would make a diagnosis of mastoid disease because there was dulness on percussion without regarding other signs and symptoms.

Entering a little further into Weygandt's paper we find that *slight* dulness was elicited by him on light percussion with the finger in:

- (a) Pathological conditions of the drum membrane;
- (b) Catarrhal conditions of the Eustachian tube;
- (c) Narrowing of the ear canal through portions of wax, or by furunculosis in the stage of repair.
- (d) In the single case of mastoid inflammation reported by him.

These results are also contradictory, and consequently unreliable. In either of the first three conditions (*a*, *b*, and *c*) there would be other signs and symptoms by which mastoid inflammation could be eliminated, while his single mastoid case could not be taken as a criterion as compared to the large number that have been observed by other authors. But aside from this, his results would not hold, as there was œdema over the mastoid, which, according to all other observers, masks any difference that might exist in the percussion sound. Weygandt admits that he was not able to percuss the mastoid satisfactorily owing to its extreme tenderness. His previous conclusion (*c*) that *marked* dulness is always present in middle-ear abscess with perforation of the drum and filling of the tympanum and ear canal with pus, is directly contradicted by this case, in which all of the

conditions cited were present, notwithstanding which there was but *slight* dulness on percussion of the mastoid. Weygandt based his conclusions that percussion was useless as a means of diagnosis of mastoid inflammation upon the fact that dulness could be due to a number of other causes, and that it was not always present in mastoid inflammation. He failed to mention the explanation which I had offered in my first paper for the absence of dulness in three of my cases—or in fact where the percussion note was a little clearer if anything than on the other side. In the first of these, the diseased area was not larger than a pea, and was deeply situated. In one of the others, pus and granulation tissue was limited to the mastoid antrum, while in the third case the diseased portion was not only deep-seated, but was surrounded by hard, compact bone. From one of the above facts, and considering that Weygandt believes the changes in the percussion sound to be due to variation in the pneumatic cells, and not as is now generally believed to disease of the bone substance itself, little weight can be attached to his observations in disproving the value of percussion as a means of diagnosing disease of the mastoid bone.

In considering recent literature in support of the method of percussion, we find an instructive case bearing on the subject reported by Körner (8) in which a decided change in resonance from a clear to a dull note was observed over the diseased mastoid, the integument over the bone being in a normal condition. A similar case was reported in my previous publication, dulness on percussion being the first sign of mastoid inflammation. Since then I have had occasion to observe a number of cases of acute mastoid disease in which the soft parts covering the mastoid had not been involved, the diagnosis resting on the dull percussion note. I am led to believe that these conditions would be encountered oftener if the operation were performed as soon as dulness was evident along with other cardinal symptoms of mastoid disease.

The ten following cases, which represent only those in which full notes were made during the progress of the disease, are of interest in this connection.

CASE 1.—Male, fifty-two years old, operated upon six weeks after beginning of the otorrhœa. Acute abscess of right middle ear, with small perforation of drum. Tenderness over mastoid on pressure, soft parts over the bone normal. Marked dulness on percussion over the diseased mastoid as compared to the other bone. At operation a large area of diseased bone was found several millimetres from the surface, and extending to the antrum, very close to the ear canal, and almost to the tip of the mastoid.

CASE 2.—Twelve years old, otorrhœa of six months' standing R. and L. Granulation tissue in external ear canal covered drum. Left mastoid very sensitive to pressure, no swelling of integument. Marked dulness on percussion. At the operation granulation tissue and pus filled nearly the entire mastoid, extending to the antrum and near to the ear canal.

CASE 3.—Female, thirty-two years old, operated on three weeks after beginning of otorrhœa. Acute suppuration of right middle ear. A large perforation in posterior segment of drum. Mastoid sensitive, no involvement of the integument. No dulness on percussion. Dulness was not apparent until two weeks later, and not marked for almost another week. At the operation pus and granulations were found extending through the entire mastoid down to the tip, into the antrum, and to the transverse sinus.

CASE 4.—Seven years old, otorrhœa after scarlet-fever, with good-sized perforation in lower part of the drum. Mastoid tender in region of the mastoid fossa. No swelling over the mastoid. Change in the percussion sound did not take place for five weeks, when it was marked. The mastoid was then opened and a large superficial area of granulation tissue, but no pus, found.

CASE 5.—Male, nineteen years old, operated seven weeks after beginning of an acute middle-ear suppuration on left side. Large perforation of the drum behind the manubrium. No swelling over the mastoid, slight tenderness on pressure. Tenderness later increased and with it appeared dulness on percussion. Operation revealed a superficial, extensive area of pus and granulation tissue.

CASE 6.—Male, five years old. Acute abscess of right middle ear. Operated three weeks after beginning of the otorrhœa. Paracentesis five days before the operation, the perforation in the drum having closed. No tenderness over mastoid, no swelling, and no dulness on percussion at that time. Three days later there was tenderness on pressure, pyæmic temperature, and dul-

ness on percussion of mastoid, though not marked. The operation revealed under a plate of healthy bone a large area of grayish-white, soft bone extending from the temporal ridge to the tip of the mastoid.

CASE 7.—Male, twenty-eight years. Acute suppurative inflammation of both middle ears. Operation four weeks after beginning of the trouble. Left, rapid recovery. Right, perforation in lower and posterior quadrant of drum. Tenderness over right mastoid. No swelling over mastoid but some just behind it, near the emissary artery. Marked dulness over the mastoid on percussion. The entire bone was found soft at the operation, granulation tissue extending throughout the mastoid process to the lateral sinus and into the antrum.

CASE 8.—Male, sixty-two years old, operated six weeks after first symptoms — deafness, tinnitus, and earache, following coryza. Left primary otitis of the mastoid without inflammatory symptoms of the middle ear. Drum intact. Ear canal slightly swollen in the upper posterior portion. Tenderness on pressure over the mastoid. No swelling of the integument. Urine normal. Dulness marked over mastoid on percussion. A large area of mastoid was found occupied by granulation tissue at the operation.

CASE 9.—Forty-six years, operation sixteen days after first earache. Primary otitis of right mastoid without suppuration of the middle ear. Repeated paracentesis of the swollen drum membrane without finding pus. Mastoid painful to pressure, no swelling. Ear canal posteriorly and upwards slightly swollen. Markedly dull percussion note over mastoid. A superficial area of diseased bone extending throughout the entire mastoid was found at the operation.

CASE 10.—Twenty-eight years, operated four days after beginning of an acute purulent middle-ear inflammation on right side. Perforation of the drum in upper posterior portion, with small polypus protruding. No swelling over mastoid or tenderness. Percussion elicited a clear note early in the course of the disease, but after three and a half weeks was markedly dull. There was then also pain on pressure over the mastoid fossa, and tip of the mastoid. No swelling. At the operation it was found that the bone was very vascular, and soft, and was invaded by granulation tissue. Granulations and pus extended into the antrum and to the sinus. Between the eroded bone and sinus was an extradural abscess.

Of particular interest among these cases are those in which the character of the percussion sound changed from a clear to a dull note, of which I can cite seven, Nos. 3, 4, 5, 6, and 10, of the above cases, one from my previous publication, and a recent case of Körner. Cases 8 and 9, and also Case 10 of my other series, of primary otitis without middle-ear abscess, were also instructive and demonstrated well the value of percussion as a diagnostic means. In Case 2, in which otorrhœa existed on both sides, the change in the percussion sound was an invaluable aid in determining which mastoid was involved. The healthy cortex of bone covering the diseased area in Case 6 accounts for the dullness being less marked in this than in the other cases.

The subject of my paper furnishes I think a good field for further investigation, though even now sufficient cases are on record to demonstrate the value of percussion in the diagnosis of mastoid disease. It gives us a means of recognizing mastoid disease earlier than was heretofore possible, and adds a valuable adjuvant to the indications for opening the mastoid.

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REPORT OF THE MEETING OF THE NEW YORK OTOLOGICAL SOCIETY OF JANUARY 24, 1899.

BY DR. H. A. ALDERTON, SECRETARY.

President, Dr. C. J. KIPP, in the chair.

Dr. KNAPP asked for discussion on the **pathology and management of mastoid empyema in children**. Also as to point of origin. There is often a very large destruction of bone and exposure of the dura. Lately he has operated on five children. In the recent cases with caries confined especially to the upper part, the suprameatal cells, a fistula was left which was most obstinate in closing; this fistula was the aditus. Five days ago operated on a child eleven months old, with considerable mastoid swelling, no middle-ear disease, no discharge, no prolapse of wall of canal. Found subperiosteal pus, outer surface of the bone over antrum rotten, carious enlargement of the antrum, granulations in the attic—this was the seat of the disease. The pus had made its way posteriorly instead of into the tympanum. It may be necessary for a cure to curette the whole attic, but he did not do it in this case, in order to preserve the hearing; he simply removed the granulations. From three to six months has been required to heal up these fistulæ in similar cases. In the great majority the pus comes from the attic through the antrum to the squama and does not affect the parts below. In other cases the perforation takes place through the posterior wall of canal. Thorough curetting superficially often brings about a cure. The original trouble is transmitted from the Eustachian tube directly to the attic, sometimes without affecting the atrium. Knapp does not advise much curetting of the attic, for the following reasons: (1)—for the preservation of the hearing; (2)—from care of the facial; (3)—because of the possibility of dehiscences of the tegmen tympani.

Dr. FRIDENBERG asked as to the appearance of the tympanic membrane in the reported cases. Dr. KNAPP stated that they were somewhat reddened but not bulging.

Dr. FRIDENBERG reported a case of **primary tuberculosis of the mastoid** in a child. Mastoid inflammation, caries, and superficial abscess was followed, not preceded, by middle-ear supuration, at first on the right then on the left side. Coincidentally cerebral symptoms developed, leading to a permanent hemiparesis. After mastoid operation the child recovered; the cerebral manifestations disappeared gradually in great part. The brain lesion was diagnosticated as a tumor of the pons, tubercular in origin. The child's father was suffering from pulmonary tuberculosis, of which he died a year later.

Dr. KNAPP thought that primary tuberculosis of the mastoid might occur, extending into the tympanum instead of outward.

Dr. TOEPLITZ thought that there was a considerable difference between the mastoiditis of infants and of small children; the bone in the former being much softer. In infants serious or even fatal bleeding may occur after operation from this condition of the bone. He thought that in the cases mentioned by Dr. Knapp the attic was not alone affected, the tympanum having a latent supuration going on, not recognized.

Dr. MCKERNON thought that in those cases in which the tympanic membrane remains intact the healing would be much facilitated and the drainage improved were the membrane freely incised.

Dr. KNAPP thought that it would be a very good idea to do this through Schrapnell's membrane, but, as a rule, when the operation on the mastoid is well done the discharge from the ear stops. Believes that the opening of the tympanic membrane is often too promiscuously done.

Dr. MCKERNON asked advice as to what should be done, after operating on the mastoid in cases of general tuberculosis, to secure healing. He had had very poor success in these cases, notwithstanding every care. Had tried packing with gauze soaked in valerianate of guaiacol, in a case of the same kind, with very good results; the granulations were more healthy, the other treatment being the same. In four months the case was entirely cured and has remained so ever since—for four months. Also good results in another case. In one case it had no effect. The mastoids were examined microscopically for the tubercle bacillus with posi-

tive results. Dr. TOEPLITZ had had good results from a different remedy—traumatol. Dr. HEPBURN thought that these results were only temporary, an arrest of the local process. Dr. MCKERNON simply reported the above as an observation not as a specific.

Dr. FRIDENBERG reported a case of **mastoiditis with a rare sequela—retropharyngeal abscess**. A man, fifty-six years of age, was operated on for an acute left-sided mastoiditis, not of the Bezold variety. He did well for about two weeks, when he developed pain, tenderness, and swelling low down in the neck, latero-posteriorly, difficulty in swallowing, and febrile temperature. These symptoms gradually increased, and swelling appeared in the right side of the pharynx. There was no pain or tenderness between the tip of the mastoid and the painful swelling in the neck. External operation released a few drachms of pus near the vertebral column and the patient promptly recovered. The case was plainly an infection and suppuration of one or more deep-seated glands, transmitted by the lymphatics or along the connective tissue, in the manner that a cerebellar abscess arises after middle-ear suppuration.

Dr. KNAPP had recorded a similar case. The patient had a severe inflammation of the middle ear, apparently with a cerebral complication. On the supposition of a brain abscess the skull was opened twice, but exploration with aspirator and knife brought out no pus. The autopsy showed purulent meningitis of the anterior lobes at the convexity and median fissure, suppuration and caries of the tympanic cavity, propagation of the pus from the attic along the *semicanalis pro tensore tymp.* to the pharynx. (See ARCH. OF OTOL., xxiv., p. 121, 1895.)

Dr. TOEPLITZ thought that Dr. Fridenberg's case resembled more a retropharyngeal abscess, the pus burrowing along the petrous bone.

Dr. FRIDENBERG stated that he had tried to make a point of the difference between his case and the ordinary *senkungs-abscess*.

Dr. ALDERTON exhibited a photograph of a case showing the results of traumatism on the auricle occurring in infancy. The patient, a young Irish girl of seventeen or eighteen, when one year old, while crawling on the cabin floor, had her **ear chewed off** by a pig. As may be seen, the entire upper three-fourths of the auricle was removed, together with the superior and posterior cartilaginous canal. The tympanic membrane was not injured apparently and the hearing remains normal.

REPORT OF THE MEETING OF THE NEW YORK OTOLOGICAL SOCIETY OF MARCH 28, 1899.

BY DR. H. A. ALDERTON, SECRETARY.

Vice-President, DR. H. KNAPP in the chair.

Dr. T. P. BERENS related the history of a **case of sinus thrombosis**. A. M., female, age twenty-one, came to the Manhattan Eye and Ear Hospital, January 12, 1899, complaining of pain in the right ear and that side of neck. The patient said that this pain began one week before her entry into the hospital, and was accompanied by swelling in the neck, which steadily increased, until on admission, when she presented a large swelling extending along the line of the sterno-cleido muscle down to the level of the thyroid cartilage. The temperature was $99\frac{1}{2}^{\circ}$ F. January 13th, her eyes were examined; the right eye-ground revealed a slightly hazy nerve with enlarged and tortuous veins. At noon the same day the mastoid was opened, and was found to be perforated at the tip. The perforation opened into a large abscess cavity inside of the sheath of the sterno-cleido-mastoid muscle. This abscess was opened by a free incision extending to the level of the cricoid cartilage, much of the muscle being divided. The whole mastoid process was diseased and was thoroughly curetted; the mastoid antrum being full of pus and granulation tissue. The bone was not particularly diseased over the lateral sinus, but owing to the condition of the eye the sinus was exposed and found to contain at least two drachms of pus. The sinus was exposed for nearly two inches, opened, and thoroughly curetted; the curette reaching the torcular before free blood was drawn. The curette failing to draw free blood from below even after the jugular bulb was reached, the wound in the neck was enlarged and the jugular exposed at the level of the cricoid cartilage and found to contain fluid blood. The pulse becoming rapid and the respiration shallow, time was not afforded to dissect the vein upward. Two ligatures were thrown around the vein and the vein divided between them. The wound was packed with gauze. The patient made an uneventful recovery. Immediately following the operation the temperature rose to 101° F., but the following night it fell to 99° F. It did not again rise above $100\frac{1}{2}^{\circ}$ F. during the whole process of her recovery.

The wound is closed, as you see, without a disfiguring scar. I show the case as an illustration of the fact that an important vein

may contain much pus without marked temperature disturbances. The patient was in the hospital one month only.

Discussion.—Dr. EMERSON asked Dr. Berens as to whether the patient's eyes were examined after the operation. Dr. BERENS—No.

Dr. MARPLE asked as to whether the clot extended in the jugular up to the point of ligation. Dr. BERENS—No.

Dr. DENCH asked as to whether the facial vein was tied off. Dr. BERENS—Yes.

Dr. BACON asked as to whether there was a clot in the jugular. Dr. BERENS—No. There was pus in the sinus and clot above and below.

Dr. BACON had a case at the Infirmary in which there was a slight amount of pus in the lower portion of the thrombus. He did not tie the jugular nor establish flow of blood very thoroughly; notwithstanding, the temperature fell and the patient recovered.

Dr. DENCH thought it a very nice point to decide when to ligate the jugular. He had a patient in whom the sinus was completely plugged by a clot and no re-establishment of the circulation followed curetting. Because of the age of the patient and the absence of pyæmic symptoms he did not ligate the jugular. Some few streptococci were found in the clot. Uninterrupted recovery followed. He thinks that in cases where there are no symptoms of general sepsis, it is preferable not to ligate the internal jugular vein.

Dr. GRUENING spoke of the case of a man who, after suffering from **typhoid fever followed by the grip, acquired a left otitis media**. There was much pain, T. 106° F., bulging of the membrane. The membrane was incised, serous fluid evacuated containing streptococci (long variety). No improvement; mastoid tender; temperature constantly high. Operated: pneumatic mastoid with cells filled with turbid serum containing streptococci; clotted blood. The sinus was exposed for two inches and was hard and clotted. The sinus wall was accidentally injured with flow of blood from above. No pus or granulations on the wall. Did not open the sinus. The next day the temperature was 100° F. and remained so. The thrombosed sinus was not opened; yet the patient recovered.

Dr. MCKERNON reported the history of a **case of brain abscess and pyæmic sigmoid sinus thrombosis following purulent mastoiditis (Bezo'd), caused by an acute oti-**

tis media ; three operations ; death. K. O., a girl; aged twenty years, first seen February 15, 1899. About four weeks before she contracted a severe cold, and the next day pain began in the ear, followed by a discharge some six days later. Before the discharge began pain interfered with sleep ; afterwards the pain abated somewhat. On February 3d the discharge stopped, and since then the pain had been very pronounced. Examination : meatus and canal free of discharge ; considerable sagging of the posterior and superior canal walls ; drum membrane bulging, especially the posterior superior portion ; marked œdema over the mastoid, extending downward into the neck ; posterior to the tip, a boggy swelling, about the size of a hen's egg, extending backward toward the occiput. This œdematous area was very tender upon pressure, and the patient carried the head well over toward the opposite side. She had had measles only, in childhood. Temperature 102.4° F., pulse 94, tongue heavily furred, with bad odor from breath.

She refused operation. The drum membrane was opened and an incision made in the prolapsed wall, and she was instructed to irrigate the canal every two hours with bichloride 1:4000, when she left the hospital.

Five days later she again came to the hospital with all of her former symptoms greatly intensified, and now consented to have an operation performed. Temperature 103.2° F., pulse 90, and she looked septic. An examination of the discharge from the left canal showed the presence of streptococci in abundance.

Operation.—Upon cutting through the periosteum a small quantity of pus escaped from the region of the tip. The cortex appeared intact, and dark in color. A small quantity of pus escaped from the antrum. The whole interior of the mastoid was found diseased, the curette removing pus, granulations, and necrotic bone. The sinus was exposed below the knee, and was markedly discolored, almost black. The sinus was accidentally opened above the knee, and profuse hemorrhage took place from the torcular side, but none from below. The portion of the sinus below the knee was opened, by slitting the dura, and a small clot of blood covered with fibrin was removed. After this removal, the return current seemed normal, and the sinus was packed in the usual manner. Continuing the removal of softened bone backward from the tip, a perforation was found leading into the bulging mass before spoken of in the occipital region. An incision, at

almost a right angle to the mastoid incision, was made over this mass, and about an ounce of dark-looking pus evacuated. The parts were flushed with sterilized water, and this followed by a flushing with absolute alcohol, the usual dressing applied, and the patient returned to the ward.

For the next four days the patient did well, the temperature ranging from 99° F to 100.4° F., pulse 94 to 100.

On the fifth day a gradual rise of temperature to 104.2° F., pulse 110; patient comfortable, bright, and did not complain. The eyes were examined by the house surgeon, who reported some redness of the optic nerves, with slight blurring of the edges.

The sixth day temperature dropped to 102° F., the patient still feeling comfortable and taking nourishment well. Dr. Dench was asked to see the case in consultation, and advised against another operation, saying he thought it best to wait and watch developments.

The seventh day the temperature rose gradually again to 104° F., pulse 102, and I decided that there was sepsis going on and determined to search for it.

Second Operation—The sinus opened at the point of the former incision, and no bleeding followed. A probe was passed backward, toward the torcular, and this was followed by quite free hemorrhage. The probe was then passed below, and from the opening made by it a few drops of pus made their way to the surface. The curette was used here, and a considerable quantity of clotted, granular material, together with fibrin and pus, was removed, after which there was free bleeding. This was controlled by a gauze wick passed down to the bulb. The field was cleansed with alcohol and a dressing applied. The patient became very weak, and twelve ounces of a hot saline solution were injected into the rectum with marked benefit. The pus from the sinus was examined, and found to contain large numbers of streptococci.

The patient passed a comfortable night and seemed bright and cheerful in the morning. The eyes were again examined, and the optic discs found markedly blurred, with veins enlarged and tortuous. The patient seemed to be improving.

Two days later the temperature rose slowly to 104° F, pulse 90, and she complained of considerable headache on the left side of the head and seemed a little dull, and at times said she felt cold

and wanted more covering put over her. These symptoms continuing throughout the day, I decided to explore further for pus accumulation.

Third Operation.—The wound was exposed and the dura around and below sinus was found to be more prominent than before. A further area of bone was removed below and posteriorly, exposing the cerebellum. An incision was made in the dura over it, and a large quantity of pus and broken-down and softened brain substance removed. The abscess cavity extended behind and around the sinus, and there was a distinct walling-off of its contents, as felt by the finger. The cavity was irrigated with a saline solution, and packed loosely with sterile gauze. On examining the bulb end of the sinus, a few drops of pus were again found, and for this reason, and for the purpose of preventing any further septic absorption, I decided to ligate and resect the internal jugular vein. This was done, ligating it just above the clavicle, and resecting to the bulb, and it was found to contain a clot for a little over two inches below the point of ligation above. Saline solution was given in the rectum, at the end of the operation, and while the patient was on the table, and she rallied well, considering the gravity of the operation and what had been done previously.

During the night she was extremely restless, and it was impossible to keep her quiet. The following day she was still very restless, with mild delirium at times. Her temperature was 104° F., pulse ranging between 80 and 86, and of very good volume, but irregular at times; kidneys acting well.

The next day she seemed better. There was no delirium; she was quiet; asked for food and said she felt comfortable. Her temperature dropped to 102.3° F., pulse 80 and of very good volume, and the tongue was beginning to show moisture, when before it had been dry. She continued improving all that day, until 5.30 o'clock in the afternoon, when she suddenly stopped breathing, and all efforts to re-establish respiration were of no avail. Oxygen and stimulation were at hand, and used persistently, with no response whatever. During all this time the pulse could be distinctly counted, and it was of fair volume. The pulsations kept growing weaker and weaker, and at the end of fifteen minutes from the time breathing ceased they stopped altogether.

We were unable to obtain an autopsy, so could not determine definitely the cause of death, but believe it to have been due to

an embolus in the respiratory centre. At the time of death the temperature registered over 107° F.

Discussion.—Dr. DENCH thought that too much importance was attached to the return flow from below ; the inferior petrosal sinus will supply the flow even though the jugular is occluded. The general condition of the patient and the presence of pyæmic symptoms are of more importance in deciding as to the investigation of the jugular.

Dr. TOEPLITZ gave the history of a **case of sinus thrombosis**. A young man, sixteen years old had had a chronic right otorrhœa for one year, following which the symptoms became acute. He was operated upon twice, first by opening the mastoid and the posterior cavity of the brain, later by opening the sinus and ligating and excising the internal jugular. General pyæmia had already established itself on the day of the first operation, with the implication of a number of joints. Infarction of the right lung, with some effusion into the pleural cavity, and endocarditis developed in the course of the disease. The patient fully recovered.

Discussion.—Dr. GRUENING thought that this was a case in which the indication was to open the sinus at once. Dr. Toeplitz agreed.

Dr. BERENS stated that in his case the remarkable point was the presence of considerable pus without much temperature. Thought that it was necessary in most cases, where return flow of blood from below could not be established, to tie the jugular. Thought it necessary to open the sinus when there was thrombosis present and to establish the return flow from below and behind.

Dr. HERMAN KNAPP read the history of a **case of serous meningitis, operated upon by Dr. Arnold H. Knapp, with presentation of the brain**. R. Klepky, one year three weeks old, admitted March 20th. Healthy parentage. Said to have had pain in the left ear for two months. A swelling above the mastoid was incised by the family physician. She did well until one week ago ; since, she has appeared ill, refused food, been sleepless, vomited, been stuporous. *On admission* : Very pale, head thrown back, stuporous, crying when aroused, pupils not reacting, wound above the mastoid in a sloughy granulating condition, no carious bone, fundi normal, *Mt.* normal, no otorrhœa. A probe introduced into the mastoid wound seems to lead forward to the meatus. Operation March 21st. The fistulous tract,

which was laid open, extended to the meatus, where it was lost. The periosteum was quite thickened and the bone was everywhere normal. Antrum and middle ear exposed. No pus. The tegmina normal. Middle cranial fossa opened and the upper surface of the petrous bone found normal. From the 21st to the 26th the patient continued in stupor; no delirium or convulsions; eyes half closed; corneæ anæsthetic; no pupillary reaction; took milk well; no vomiting; pulse 140; T. 100°-101° F. 24th-26th, slight convergent strabismus; fundi normal; Cheyne-Stokes respiration; P. 150. March 26th, appeared better; respiration regular; difficulty in swallowing; convulsions set in toward night; child died at 4 A.M. *Autopsy*: 8 A.M., temporal bone absolutely normal. In the ventricles, an abnormal quantity of fluid. In the arachnoid, a few small clusters of miliary nodules (which on subsequent microscopic examination proved to be tubercles).

Discussion.—Dr. KNAPP thought that in another case he would do a lumbar puncture, expose the dura and incise.

Dr. CH. H. MAY related the history of a **case of serous meningitis, causing deafness; autopsy**, which had been observed by him for several weeks at the Mt. Sinai Hospital. Upon admission to the hospital the man, twenty-five years old, gave a history of having had some severe illness several weeks previously; headache was a prominent symptom of this disease, but no diagnosis nor particulars could be obtained. Upon admission he complained of severe pains in the head, more or less generally distributed, and of deafness. Examination of the drum membrane revealed nothing abnormal. There was absolutely no hearing in one ear and in the other merely a suspicion of faint perceptions of very loud noises. There was no elevation of temperature, pulse was normal, bowels regular. The patient was weak but able to be up most of the time. His deafness was his most prominent symptom. He claimed that he had had good hearing previous to the illness which he had some weeks before entering the hospital. Examination of the fundus oculi was negative and there were no ocular evidences of cerebral disease.

The man remained in the hospital two weeks, then suddenly developed chills, followed by an elevation of temperature (104°), drowsiness, then coma, and death followed in thirty-six hours. At the autopsy the ventricles were found greatly distended with serum in which there were a number of flakes of fibrinous character; there were no other changes.

Discussion.—Dr. GRUENING asked as to whether the *ependyma* was thickened. Dr. MAY—No.

Dr. GRUENING stated that in cases that he saw with Dr. Jane-way there was marked *optic neuritis*.

Dr. BACON presented **an electric illuminator for aural examination**. Dr. DENCH had not had very good success with electric illuminators; they were unreliable. He exhibited a **candle illuminator** with **reflector**, made by the Gorham Manufacturing Company, which was portable and utilized the ordinary coach candle.

Dr. BACON had had considerable trouble with candle illuminators. Very frequently they did not burn brightly, and they were open to objection in regard to conflagration, should the use of an anæsthetic be necessary.

Dr. DENCH asked as to whether the power was derived from a storage or a dry-cell battery. Dr. BACON—Storage.

Dr. GRUENING reported a **case of caries of mastoid affecting both sides; torticollis due to softening of bone; optic neuritis (double)**. A boy, aged eleven, was admitted to the Mount Sinai Hospital, on November 22, 1897. He suffered much from headache and had a discharge from the ears. Both mastoids were tender and the optic discs were choked. The boy remained under observation until December 2d, when a subperiosteal abscess developed behind the right auricle. The usual operation was performed on the right mastoid. Though the healing of the wound progressed favorably, a marked torticollis of the right side made its appearance, and the right post-mastoid region became tender. On December 16th it became necessary to operate upon the left mastoid process. Both mastoid wounds showed a tendency to heal normally, yet the right torticollis and the tenderness behind the right mastoid process persisted. The boy continued to complain of headache; optic neuritis was still present, but vision was normal. On December 27th the wound over the right mastoid was reopened and increased in size by a transverse incision posteriorly. The bone covering the sigmoid sinus and the dura mater of the posterior fossa was soft, succulent, yet bloodless over an area of two square inches. All this diseased bone was removed. On October 30th the torticollis had disappeared and the neuritis was less pronounced. February 3d, 1898, boy discharged, cured.

Discussion.—Dr. DENCH stated, with reference to the occurrence

of optic neuritis in the cerebral complications of otitis, that if the current in the sinus is shut off, optic neuritis is bound to be present.

Dr. GRUENING thought that *torticollis* might be brought about by disease of the bone to which the muscle was attached. Why the boy should have had neuritis is not so clear (may have been due to auto-infection?).

Dr. BACON spoke of a **case of Eustachian-tube catarrh** that he saw some time ago in consultation. Vertigo came on suddenly, several days after the removal of a plug of wax from the ear, with slight deafness in the affected ear; *Mt* retracted; catarrh of the Eustachian tube; staggering gait. Suggested inflation of the middle ear, following which the patient recovered.

Dr. GRUENING asked as to whether it was a case of Eustachian plugging or obstruction. Dr. BACON—Not very markedly obstructed.

Dr. DENCH thought it to be a very nice point to determine whether the tube was in a patent condition. Perfect inflation of the middle ear at any one time does not prove that the tube is normal. The calibre of the tube may often appear to be reduced by vaso-motor paresis, in neurotic patients, although no organic lesion is present. The diagnosis between disease of the middle and internal ear should be made by means of a functional examination.

Dr. SHEPPARD spoke of a patient who complained of the occurrence of **explosive noises in the ear**, when going to sleep.

Dr. DENCH thought that the noise might be due either to a sudden separation of the walls of the Eustachian tube or to a choreic contraction of the tensor tympani muscle. Dr. SHEPPARD did not think that the former could be the case. It might be due to the tensor tympani.

Dr. EMERSON : Does a change in posture have any influence?
Dr. SHEPPARD : It does not.

Dr. FRIDENBERG related the history of a **case of erysipelas of the ear following Asch's operation on the nose**.

Dr. GRUENING described a **case of erysipelas extending over the mastoid from a furuncle on the scalp**.

Dr. BERENS : reported a **case of mastoiditis ; operation followed twenty-four hours later by facial erysipelas**.

Dr. GRUENING reported a case in which, following the removal of a nasal polypus, ear trouble developed. The strepto-

coccus was found first in the nose, then in the ear. **Mastoiditis** necessitated operation, and on the third day after, **erysipelas** of the face appeared.

Dr. J. L. ADAMS reported a similar case.

Dr. DENCH had seen three similar cases, none fatal.

Dr. TOEPLITZ also.

Dr. BACON thought that it was the usual experience to have these cases recover.

Dr. KNAPP reported a **case of erysipelas** following the mastoid operation, **with loss of hair** over the erysipelatous area. No syphilitic history.

Dr. HEPBURN thought that this was not an unusual experience.

Drs. GRUENING, KNAPP, and BACON had not observed this symptom before.

Dr. ALDERTON presented two **specimens**. The first showed *deficient development of the external canal walls*, the anterior wall being almost totally absent, the superior and inferior walls being partially absent, and the posterior being very badly developed, and in one place showing a dehiscence opening into the mastoid cells. The second specimen showed *hyperostosis of all the ossicles*, to the extent of double or treble their normal size and thickness; this hyperostosis was uniform throughout.

REPORT OF THE PROGRESS IN OTOTOLOGY DURING THE FOURTH QUARTER OF THE YEAR 1898.

ARRANGED BY DR. A. HARTMANN.

Translated by Dr. ARNOLD H. KNAPP.

ANATOMY OF THE EAR.

268. GIANNI, G. Anatomical contribution to the study of the striæ acousticæ in man. *Arch. ital. di Otolog.*, vol. vi., p. 389.

268. GIANNI examined histologically the striæ acousticæ in a tumor which involved the region of the striæ. During life paralysis of the sixth, seventh, sensory branch of the fifth and the eighth were present. At autopsy a purulent meningitis at the base and a tubercle in the fourth ventricle were found. Gianni concludes that the greater number of the acoustic striæ decussate with those of the opposite side. GRADENIGO.

PHYSIOLOGY OF THE EAR.

269. NAGEL and SAMSJLOFF. Some experiments on the transmission of sound vibrations to the middle ear. *Arch. f. Anat. u. Physiol.*, Nos. 5 and 6, 1898, p. 515.

270. LUCAE, A. Historical note on the mechanism of the drum membrane and the ossicles. *Arch. f. Ohrenheilkunde.*, vol. xlv., p. 300.

269. The authors placed the middle ear of a fresh animal's head (ox) as a gaseous chamber in communication with a König's sensitive flame. The drum membrane was then put in motion and the reaction of the gas flame was watched in the rotating mirror. The gas was admitted by the Eustachian tube, and passed off through a perforation at the base of the skull. The vowel

curves were easily demonstrable. A tuning-fork held at the auditory canal caused the drum membrane and the flame to vibrate. The reaction of the flame was intensified if the outer opening of the meatus was closed. By interfering with the vibrations of the drum membrane through pouring in of mercury, the cranio-tympanic reaction shown in the preceding experiment was absent.

ASCHER.

270. Hermann Meyer demonstrated the mechanism of the sound-conveying apparatus and especially the axial band in his text-book in 1856, in other words long before Helmholtz.

BLOCH.

GENERAL.

a.—REPORTS AND GENERAL COMMUNICATIONS.

271. NEW YORK EYE AND EAR INFIRMARY.—78th Annual Report for the year ending September 30, 1898. Aural Surgeons: Bacon, Dench, Adams, Whiting, McKernon, McAuliffe.

272. OPHTHALMIC AND AURAL INSTITUTE.—29th Annual Report for the year ending September 30th, 1898. Surgeons: H. and A. Knapp, Toeplitz, Coburn, Guttman, and Lynch.

273. MÜLLER, R. Report of Prof. Trautmann's Ear Clinic, for the year from April 1, 1897, to March 30, 1898. *Charité Annalen*, 23d year.

274. PASSOW. Examination of ear diseases after accidents. *Monatschrift für Unfallheilkunde*, 1898.

275. MÜLLER, R. The diagnosis of traumatic affections of the internal ear. *Charité Annalen*, 23d year.

271. Number of new patients, 7251; operations, 1116; removal of granulations and polypi, 113; paracentesis of membrana tympani, 369; ossiculectomy, 35; opening of mastoid cells, 138; Stacke operation, 6; removal of adenoids, 194; operation for thrombosis of sigmoid sinus, 6; operation for thrombosis of internal jugular vein, 3; operation for epidural abscess, 16; operation for subdural abscess, 3; of 9 cases of sinus thrombosis, 7 recovered; of 19 cases of epidural and subdural abscesses, 15 recovered.

GORHAM BACON.

272. Number of new ear cases, 1375; nose and throat cases, 1338; number of operations, 430; paracentesis of membrana tympani, 45; removal of granulations, 39; opening of mastoid cells, 22; incision of furuncle of external meatus, 35; ossiculectomy, 4; operation for thrombosis of sigmoid sinus, 1 (recovered); removal of adenoids, 109.

GORHAM BACON.

273. 196 in-patients were treated in the CHARITÉ EAR CLINIC, for 1897; 469 patients received treatment in the dispensary; 67 radical operations were performed; 12 remained in treatment from the preceding year. One of the reported fatal cases deserves especial mention. In a child, the mastoid was opened on account of a periosteal abscess. An hour after operation patient was taken back to his home. Death occurred seven hours later possibly from aspiration of the vomitus. This case furnishes another warning against performing larger operations on the temporal bone unless patients remain at the clinic. Cholesteatoma was found in 16 % of the operative cases, a rather low percentage (Manasse and Wintermantel found 48 %).

The present ward for ear patients contains thirty patients; unfortunately in the plans for the new Charité this number will be reduced. PASSOW.

275. MÜLLER gives a review of the general symptoms which enter into the diagnosis of the traumatic affections of the internal ear, and their significance in the written opinion of labyrinthine concussion. It is necessary to ascertain whether the four chief symptoms, diminished hearing, headache, vertigo, and subjective noises, are really present and if they are in any way connected with the accident. To form any opinion, the patient must be under observation for some time at a clinic. PASSOW.

b.—METHODS OF EXAMINATION AND TREATMENT.

276. LANNOIS et TOUNIER. Aural lesions are a frequent determining cause for agorophobia. *Ann. des mal. de l'or., du lar.*, No. 10.

277. COMBY. Poisoning of a child with carbolic acid. *Soc. m. des Hôpitaux de Paris*, 1898.

278. AMBLER, C. P. The pneumatic cabinet as a means of inflating the middle ear. With remarks as to the advantages and disadvantages of the various methods employed. *The Laryngoscope*, Oct., 1898.

279. MILLENER, F. H. The use of nosophen and antinosine in purulent disease of the middle ear. *Buffalo Med. Jour.*, Dec., 1898.

280. BONNIER. Paracusis based on a particular form of Weber's test. *Arch. int. de lar., d'ot.*, xi., p. 6.

281. GRUNERT. On Kirchner's results on poisoning with

salicyclic acid and quinine. *Arch. f. Ohrenheilk.*, vol. xlv., p. 161.

282. CONNALL. A case of myxoedema with deafness and tinnitus in a man, thirty-six years old. *Glasgow Med. Jour.*, Oct., 1898.

283. HEERMANN. Relation of certain ear diseases to general pathology. *Deutsche med. Wochenschr.*, 1898, No. 49.

284. ROSATI, T. Bullet wounds of the ear. *Arch. ital. di otologia*, vol. vii., p. 55.

285. GERONZI, A. Ocular disturbance in ear disease. *Arch. ital. di otologia*, vol. vii., p. 331.

286. COURTADE. Aural speculum to measure the inclination of the hammer. *Arch. int. de lar., d'ot.*, xi., p. 6.

287. DE SIMONI, A. Intratympanic injections in the treatment of chronic middle-ear catarrh. *Arch. ital. di otologia*, vol. vii., p. 81.

288. WARNECKE. Air rarefaction in the meatus combined with catheterization. *Arch. f. Ohrenheilk.*, vol. xlv., p. 251.

289. SCHLEICHER. The vibratory massage of the drum membrane. *Arch. int. de lar., d'ot.*, xi., p. 5.

290. HUMMEL. The functional examination of the ear by the medical practitioner. *Deutsche militärärzt. Zeitung*, 1898, p. 515.

291. WARNECKE. A functional examination to detect simulation. *Arch. f. Ohrenheilk.*, vol. xlv., p. 265.

292. URBANTSCHITSCH. The value of methodical hearing exercises for deaf-mutes. *Wiener klin. Wochenschr.*, No. 50, 1898.

293. HALASZ. Hydrogen peroxide in rhinology and otology. *Wiener klin. Wochenschr.*, No. 50, 1898.

294. ZAALBERG. A cutting ear-forceps. *Monatschr. f. Ohrenheilk.*, No. 10, 1898.

295. KUGEL. A new hearing apparatus for the deaf. *Wiener med. Wochenschr.*, No. 46, 1898.

276. Ten cases are reported to show that agorophobia may be caused or kept up in nervously disposed persons by ear disease with vertigo or subjective noises. Several of the cases are confirmatory, for with improvement in the aural condition a disappearance of the agorophobia was noticed; others are less so, as the ear lesion resisted treatment. ZIMMERMANN.

277. A child had had its ear irrigated for ten days with

carbolic-acid solution, 15 to 1000, and carbolized glycerine was instilled. Hæmaturia set in. Recovery after cessation of the carbolic-acid treatment.

278. AMBLER finds that the pneumatic cabinet possesses advantages over the Valsalvian and Politzer methods of inflation, and the only objection to its use is the cost of the cabinet and the room it takes up in an office.

GORHAM BACON.

279. MILLENER has used these remedies in thirty-six cases, twenty of them being cases of acute otitis media purulenta, and sixteen chronic otitis media purulenta. Many of these cases, however, had adenoids and enlarged tonsils, which were excised. He considers these drugs to be superior to those in general use for this condition.

GORHAM BACON.

280. This remarkable discovery which BONNIER calls *paracusis Weber*, is that the sound of the tuning-fork is lateralized to the diseased ear when the fork is placed on a bone distant from the ear,—olecranon, knee, or ankle. The tone on the other hand is not lateralized if the fork is placed, as in the usual *Weber*, on the vertex. Diseases of the sound-conveying apparatus may thus be recognized when ordinarily after the negativeness of *Weber's* experiment a lesion of the sound-perceiving apparatus was supposed. This test is also prognostically of importance. Bonnier does not state the number or the kind of patients observed.

ZIMMERMANN.

281. GRUNERT asphixiated white mice and doves, and examined histologically their labyrinths and middle-ear structures to see whether *Kirchner's* findings could be accounted for by suffocation. He found hyperæmia and blood-extravasates, but to a less extent and not at the same places as *Kirchner*. Grunert believes, therefore, the hemorrhages in the cochlear duct observed by *Kirchner* to be the result of the medicines employed.

BLOCH.

282. CONNAL noticed that the mucous membrane covering the inf. turbinated bones was greatly swollen and lying against the septum, and that the uvula was elongated and wrinkled. Under thyroid tabloids this swelling went down, and the hearing and tinnitus quite disappeared.

283. HEERMANN gives five complete histories of patients afflicted with various degrees of middle-ear catarrh and with sclerosis. All of the patients suffered from disturbances of digestion and circulation, and symptoms referable, according to the

author, to beginning arterio-sclerosis. Treatment of the general condition in addition to that of the local trouble produced marked and persistent improvement. He believes that treatment with thyroid extract, as proposed by Vulpius, is justifiable in cases where the general conditions seem to call for this treatment, though he acknowledges the fairness and failures of Bruck's experiments.

NOLTENIUS.

284. From eight personal observations and experiments on the cadaver, ROSATI concludes that revolver bullets can enter the skull with difficulty, owing to the resistance of the bone. The extraction of the bullet is difficult because of the uncertainty of its position, the chance of its altered shape, and the severity of the injury. Hearing is more or less severely impaired.

GRADENIGO.

285. In an otitis following influenza an abducent paralysis set in after a few days, which disappeared in a short time.

GRADENIGO.

286. COURTADE has devised a speculum marked in degrees, and with a vertical plumb line to read off the angle at which the handle of the malleus deviates from the vertical. He has found this instrument of value, especially in young people, as a gauge for the success of his treatment.

ZIMMERMANN.

287. In certain cases DE SIMONI obtained good results by injecting vaseline-oil and iodoform-ether through the Eustachian tube.

GRADENIGO.

288. This is an arrangement by which the air in the meatus is rarified to a measurable degree, and at the same time catheterization takes place. The combined action is more potent than either alone. Cases of chronic catarrh, etc., are said to be improved.

BLOCH.

289. SCHLEICHER does not see any advantage in the vibratory apparatus driven by a motor over the old methods. The rapidity of the concussions is not so essential as the regularity, and the extent of the movement.

ZIMMERMANN.

290. The author reviews the various methods of conducting the functional examinations and gives his own method where the condition of the drum membrane is negative, which is as follows :
1. Examination of both ears with whispering voice. 2. The length of perception for bone-conduction (Schwabach) with *a'* and *A* placed on the vertex. 3. Rinne's test with *a'*, noting the difference in seconds between bone- and air-conduction. 4. Perception of

deep tones in air-conduction with C_1 . 5. The same with the Galton whistle for high tones, remembering that in sclerosis these tones are often heard only in gaps. 6. In one-sided deafness, Weber's test. Then follows the use of catheter, etc. BRANDT.

291. An excellent method for the proper case. Two examiners stand, one as far away as possible, the other next to the patient. The nearer one begins to whisper, which the distant one continues directly in the same tone of voice; or the distant one whispers while the near one is silent or blows gently against the ear of the patient as if whispering. BLOCH.

292. URBANTSCHITSCH shows that Gutzmann's poor results with hearing exercises in deaf mutes were due to a faultily applied method. With this same method the hearing in Vienna had been improved. POLLAK.

293. HALASZ employs hydrogen peroxide in ac. and chr. otitis, and as a hemostatic in the ear and the nose. POLLAK.

294. GRÜNWALD'S nasal forceps modified for the ear.

EXTERNAL EAR.

296. WARNECKE. Varicocities of pregnancy in the external meatus, the auricle, and surrounding parts. *Arch. f. Ohrenhkl.*, vol. xlv., p. 267.

297. VILLA. Fibroma of the lobule after repeated introduction of an earring. *Archiv. ital. di Otol.*, vol. vii., p. 154.

298. DE SIMONI. The artificial closure of perforations in the membrana tympani. *Archiv. ital. di Otol.*, vol. vii., p. 156.

296. The dilated veins had developed in the course of 4 pregnancies, and surrounded the auricle extending to the hair, and were present on the auricle and in the canal. The drum membrane remained free. They reached their full development at the end of the third month and diminished after birth. Occasionally there were hemorrhages. Organs of the neck and chest were normal. BLOCK.

297. Two small fibromatous tumors in the lobule at the perforation for the earring. GRADENIGO.

298. Closure with the application of trichloroacetic acid took place 11 times in 14 cases. GRADENIGO.

MIDDLE EAR.

a.—ACUTE OTITIS.

299. POWER, D'ARCY. Otitis media followed by mastoid abscess in an infant aged five weeks. Operation. Recovery. *British Med. Journal*, Nov. 19, 1898.

300. LARSEN, S. C. Remarks on the treatment of acute purulent otitis. *Arch. f. Ohrenheilk.*, vol. xlv., p. 285.

301. MENIÈRE. A case of Bezold's mastoiditis. *Arch. internat. de lar. d'Otol.*, etc., vol. xi., p. 5.

299. A female infant aged five weeks was brought to D'Arcy Power on June 16, 1898. Discharge from left ear two weeks. Swelling behind ear two days. Temperature 100°. On incising a small track found leading into antrum which was opened and found full of granulation tissue. Recovery. CHEATLE.

300. From an observation of 60 patients at the Copenhagen Military Hospital it seemed that the length of disease up to cure was uninfluenced whether the patients remained in bed during the entire sickness or not. The cases treated dry healed very much quicker than where instillations (sublimat 0.005, cocaine 0.20, aqu. 10.0) were introduced. There was no fœtor in those treated by the dry method, and among the 8 which developed granulations there was only one of these. The 4 cases with complicating mastoiditis had all received instillations. The dry packing was performed with sterilized pledgets of cotton.

BLOCH.

b.—CHRONIC PURULENT OTITIS.

302. CHEATLE, A. H. Operative interference on the drum and ossicles in chronic middle-ear suppuration. A comparative study. *The Practitioner*, October, p. 362, 1898.

303. WHITE, FAULDER. Suppurative Otitis Media Complicated by Hyperplasia of the Meatus. *Lancet*, Dec. 24, 1898.

304. WHITE, F. FAULDER. Exfoliation of cochlea. *Lancet*, Dec. 17, 1898.

305. HILL, WM. Paresis of right facial nerve and of the right side of the palate following tympanic suppuration. *Proceedings of the Laryngological Society of London*, Nov. 4, 1898.

306. GOLDSTEIN, M. A. The modern therapy of suppurative otitis media. *The Laryngoscope*, Dec., 1898.

307. AVOLEDO. Anchylosis of the jaw after purulent otitis. *Arch. ital. di Otologia*, vol. vii., p. 65.

308. LUBET-BARBON. A case of enormous cholesteatoma of the temporal bone. *Arch. intern. de lar. d'ot.*, xi., p. 6.

309. JANSEN, A. A frequent involvement of the labyrinth in the purulent otitides. *Arch. f. Ohrenhkl.*, vol. xlv., p. 193.

310. DREYFUSS. Middle-ear tuberculosis with special consideration of its termination in healing. *Inaug. Dissertation*, Bâle, 1898, 104 p.

311. ZAALBERG. Aristol in otology. *Monatsch. f. Ohrenhkl.*, No. 12, 1898.

312. ZERONI. A study of the healing process after the operative exposure of the middle-ear spaces. *Arch. f. Ohrenhkl.*, vol. xlv., p. 171.

313. REINHARD. Thiersch's transplantation after trephining the mastoid. *Arch. f. Ohrenhkl.*, vol. xlv., p. 186.

314. V. MOSETIG-MOORHOF. Plastic closure of the bony defect in the mastoid process by means of a folded skin flap. *Centralblatt f. Chirurgie*, No. 46, 1898.

302. CHEATLE has collected the views of some of the leading aural surgeons of the world on this procedure and in conclusion briefly reviews the entire question as follows: The operation is undertaken (a) to remove the cause of the discharge and (b) to improve the hearing after the discharge has ceased.

(a) To remove the cause of the discharge. Indicated when ordinary treatment has been unsuccessful and there are no signs or symptoms of extension. These cases may be divided into groups according to the site of the perforation. 1. If in Shrapnell's membrane, the indication is important, as chronic disease in the attic with its attendant dangers is generally present. Improvement in hearing is frequently obtained. If a cure is not effected the radical post-aural operation is demanded. 2. If the perforation is situated in the posterior-superior quadrant the incus is usually carious and the attic may become secondarily affected. 3. Perforation in other parts of the drum can usually be successfully treated with lesser surgical procedures than the removal of the ossicles.

(b) To improve hearing after the discharge has ceased. Implication of the labyrinth must be excluded. Cases requiring this intervention may be divided into groups according to the presence of, 1, solution of ossicular continuity; 2, adhesions; 3, flaccid cicatrices; 4, retained epithelial deposits, etc., behind the drum. 1. In this group generally the malleo-incudal articulation is functionless through disease of the incus. To test the conducting power of the drum and ossicle it is advisable to gently stroke the drum with a fine probe or a brush, etc. 2. Adhesions may be superficial or deep, or both. If improvement does not occur after

removal of drum, malleus, and incus, the deeper adhesions about the stapes, round and oval windows, should be dealt with. An adhesion frequently seen passes down from above to the head of the stapes. The question of the removal of the stapes requires further investigation. Improvement has followed section of the adhesions occluding the *round* window. 3. A flaccid cicatrix may be benefited by multiple incisions, but adhesions are usually present. 4. Retained matter behind the membrane usually requires only incision, though removal of the drum and malleus may be necessary.

A. H. K.

303. A man, aged forty, who had suffered with discharge from the left ear for six or seven years, came to FAULDER WHITE, in July last, with cessation of discharge and pain in the left side of head. The meatus was found to be blocked by a firm sessile fibro-cartilaginous growth on the posterior meatal wall. The growth was removed with the knife and scissors, allowing a large amount of pent-up pus to escape. Recovery.

CH.

304. A woman, aged twenty-eight years, had suffered with discharge from the right ear since childhood. In September, 1897, she had a severe illness, was delirious and sick with pain in the ear and side of head. She came under FAULDER WHITE'S care in October, 1898. While removing some polypi from the middle ear, a sequestrum, consisting of the modiolus and part of the osseous spiral lamina, came away.

305. In addition to the right facial paresis, there was marked asymmetry of the palate, the arch being much higher on the left side; the right was flaccid, the uvula being adherent on that side.

CH.

307. Ankylosis of the jaw after purulent otitis is the result of extension of the suppuration through the fissure of the malleo-maxillary ligament.

GRADENIGO.

308. The symptoms of the cholesteatoma were otorrhœa of six months' duration, and occasional headache; the ear had been deaf since childhood. At the operation it was found that the temporal bone consisted of a cavity as large as a hen's egg surrounded by a soft shell. The bone had disappeared underneath the periosteum, the dura, and the sinus.

ZIMMERMANN.

309. This paper has been reported under the heading of Congress of German Scientists at Frankfort, 1896.

BLOCH.

310. DREYFUSS gives a complete description of middle-ear tuberculosis from the historical, pathological, and clinical aspect.

He describes three characteristic groups of this disease. 1. The so-called scrophulosis, with abscesses and fistulæ about the mastoid, usually in children; prognosis good. 2. The incurable progressive form in florid consumptives. 3. The stationary form of which every chronic otorrhœa is suspicious, which, where no evidence of cholesteatoma is present, resists rational treatment. The basis of the paper are seven histories of healed middle-ear tuberculosis from Liebermann's cases.

BOENNINGHAUS.

311. ZAALBERG recommends aristol in the after treatment of the radical operation.

KILLIAN.

312. ZERONI gives the histological examination of two temporal bones which were examined six weeks and one year after an operation for cholesteatoma had been performed. Cysts were found beneath the new-formed epidermis of the tympanum, in one case, communicating with the Eustachian tube. These cysts, Zeroni thinks, may account for the retarded healing.

BLOCH.

313. REINHARD, who is not in favor of the regular primary closure of the retro-auricular wound, recommends Thiersch's transplantation for rapid epidermisation.

BLOCH.

c.—COMPLICATIONS OF PURULENT OTITIS.

315. TILLEY, HERBERT. Case of abscess of temporo-sphenoidal lobe. Operation. Recovery. Remarks. *The Laryngoscope*, December, 1898.

316. HAMMOND, PHILIP. A case of necrosis of the mastoid with septicæmia and gangrene of the lung: operation: recovery. *Boston Med. and Surg. Journal*, Dec., 22, 1898.

317. WOODS, HIRAM, JR. Cases of mastoid disease. *Maryland Medical Journal*, Dec. 22, 1898.

318. GRADENIGO. On the value of the ophthalmoscopic examination in intracranial complications, etc. *Ann. des mal. de l'or. du lar.*, No. 12, 1898.

319. MEIER. A contribution on the pathology and therapeusis of otitic brain abscess. Jubilee publication of the Magdeburg Medical Society, 1898.

320. HEINE. A case of brain abscess. *Arch. f. Ohrenhlk.*, vol. xlv., p. 269.

321. POLI, C. Intracranial otitic complications. *Arch. ital. di Otologia*, vol. vii., p. 1.

322. HOFFMANN. A case of healed brain abscess. *Deutsche med. Wochenschr.*, No. 49, 1898.

323. MÜLLER. An otitic cerebellar abscess cured by operation. *Deutsche med. Wochenschr.*, No. 49, 1898.

324. GRADENIGO. Important semiologic peculiarities in otitic thrombosis of the lateral sinus. *Arch. ital. di Otologia*, etc., vol. vii., p. 84.

325. SCHMIDT. A case of otitic pyæmia. *Deutsche med. Wochenschr.*, No. 46, 1898.

315. The case reported was that of a child, nine years of age, who had a chronic suppurative otitis media of the left ear. When six years of age she had mastoid disease on the same (left) side and an operation was performed. She was apparently cured but the discharge never ceased. Recently she complained of severe earache with scanty discharge. Both pupils very widely dilated. Temperature, 98.6° F.; pulse, 70. The patient became extremely irritable, with a pulse of 54. Operation; antrum found filled with greenish, offensive pus; tympanic roof gone, and an opening extended through the dura into the brain substance. The patient recovered.

GORHAM BACON.

316. The case reported was that of a boy, sixteen years of age, who had had a chronic otorrhœa followed by inflammation of the mastoid cells. There were chills, followed by fever, nausea, and vomiting, with dizziness. The mastoid cells were almost entirely destroyed and filled with foul-smelling pus. The sinus was injured during the operation. As free hemorrhage occurred, the operation was suspended. There were however more chills and symptoms of blood-poisoning, so that the dressings were removed the third day after the operation. Tenderness along the neck developed and a swelling made its appearance beneath the mastoid tip. The antrum was thoroughly curetted. The sinus was found soft and apparently contained no clot. The abscess in the neck was opened and a counter opening made in the neck. Somewhat later a cough manifested itself due to gangrene of the lung. The boy made a good recovery.

GORHAM BACON.

317. WOODS reports a case of primary periostitis of the mastoid cortex in a girl, twenty-four years of age, who complained of earache for one week. The hearing was normal and there were no evidences of middle-ear disease. The patient recovered. Second case: acute suppurative otitis media. Supra-cortical collection of pus (dissecting tympano-mastoid abscess). The child, three years of age, had an acute suppurative inflammation of the left ear. There was a small perforation in the upper and

posterior angle of the drumhead. Otorrhœa profuse. This was followed by a large post-auricular swelling and the superior canal wall was swollen. An incision was made in the abscess cavity behind the auricle but the cortex was not opened. Recovery followed.

GORHAM BACON.

318. GRADENIGO has collected 635 cases (including 74 of his own) where an ophthalmoscopic condition was present in 172, in which a papillitis was present in one half the cases. Even in extracranial abscesses fundus changes were noted in 41 per cent., as opposed to Grunert's statement. The diagnosis of an intracranial complication is assured by the presence of a fundus change, as a papillitis occurs so rarely in a simple otitis or mastoiditis that it can be disregarded. It however, does not affect the prognosis, for a papillitis may be present in a mild case, and be wanting in the severe one.

ZIMMERMANN.

319. MEIER reports the four following cases :

1. Man aged forty-one, bilateral acute purulent otitis and inflammation of the labyrinth following erysipelas ; on seventeenth day of illness, mydriasis right, then vomiting, rigidity of neck, headache, fever with slow pulse, tenderness on percussing the skull, especially on right side, but no mastoid tenderness. At operation fetid pus in mastoid (not in middle ear). Caries of tegmen tympani. Exposure of discolored dura, pia. Evacuation of pus from puncture of temporal lobe. Death on following day. Autopsy revealed labyrinth filled with pus, meningitis transmitted by int. auditory meatus ; in middle of lower temporal lobe a cavity the size of a walnut.

2. Girl, eight years old, right o. m. p. c. cholesteatoma, rigidity of neck, stupor, swollen cord along sterno-mastoid. Lumbar puncture revealed clear fluid. Evening temperature 39.8, morning 37.3. *Operation* : A cavity with purulent contents in mastoid, connecting with extradural space. Cerebellum softened, diffuse purulent encephalitis. Transverse sinus and jugular vein thrombosed to thyroid vein. Ligature of int. jugular above clavicle, resecting a portion 8 cm long. Streptococci were grown from the lumbar puncture fluid. Death four days later. *Autopsy* : Sequestrum of cochlea surrounded by granulations. Meningitis.

3. Boy, sixteen years old : left chronic purulent otitis, vertigo, headache. *Operation* : Caries of roof of tympanum and antrum ; evacuation of temporal lobe abscess from the base. In good condition until the seventh day, when collapse, pain, total deafness

on the opposite side with clear cerebation set in. After puncture and evacuation of pus from the temporal lobe improvement also of the hearing. Five days the same picture as before puncture. Counter opening at squama. Fluid from lumbar puncture is clear. Death on following day. *Autopsy*: No meningitis. Cause of death: Variation in pressure caused by traction of the cavity on the surrounding parts of the brain.

4. Man, thirty-nine years old, right o. m. p. c. cholesteatoma. *Operation*: Caries of roof of tympanum. Infiltrated dura. No brain pulsation. Pus after incision. Further course normal except removal of granulation at horizontal semicircular canal. After three weeks ear dry. Healing permanent.

The author emphasizes importance of early operation, the value of lumbar puncture, the way of infection from the ear, and believes that the cerebral complication must be sought from the ear.

BRÜHL.

320. Three cases of left-sided abscess in the temporal lobe operated on in 1897 at Lucae's clinic and healed.

1. Woman, twenty-four years old, double otorrhœa since childhood, admitted in stupor. Left mastoid tender, swollen, fetid discharge, granulations, papillitis, retarded pulse. An abscess in the left temporal lobe was diagnosed. *Operation*: Cholesteatoma and empyema of the left mastoid, sinus intact, tegmen antri greenish, was removed, fetid pus appeared from a fistula in dura, the latter was then freely exposed. Incision in temporal lobe evacuates two teaspoonfuls of thin pus. Drainage-tube gauze tamponade. On recovering consciousness after operation, patient presented amnesic aphasia.

2. Man, twenty-one years old, left otorrhœa since childhood. In 1897, sudden bilateral loss of sight, left meatus filled with a polyp. Both pupils wide and irresponsive, optic neuritis with atrophy. Left ptosis. Radical operation; fetid cholesteatoma of mastoid and tympanum, no fistula at tegmen to be found. On following day a fistula is found in tegmen aditus and from this a second in the dura which evacuated one fourth litre pus under heavy pressure. Healing after three months; later patient became affected with paranoia.

3. Boy, thirteen years old, double otorrhœa since childhood. In 1893 was operated on for cholesteatoma on right side. Toward end of 1897 l. headache, vertigo, vomiting, chills, fever. Cholesteatoma of antrum and attic. Dura of temporal lobe partly ex-

posed, granulating. Sinus free. One week later amnesic aphasia, papillitis; temporal lobe abscess opened. Six hours after operation the aphasia has passed off. Healed in six months.

BLOCH.

322. After remarking on the great difficulties connected with the differential diagnosis of intracranial complications (extradural abscess, sinus phlebitis, meningitis, brain abscess), HOFFMANN reports a successful case of brain abscess in the temporal lobe, which had caused paralysis of the left arm and left leg, stupor, and pulse reduced to 44 beats in the minute. A cup of fetid pus was evacuated, and a few hours later consciousness returned, and the paralysis disappeared. The abscess cavity did not heal for ten weeks, and otorrhœa ceased after five months. Patient is perfectly well.

NOLTENIUS.

323. Man, twenty-three years of age, with long-standing left otorrhœa. At the radical operation the bone was found unusually hard, though no signs of any intracranial complications were found. Immediately after the operation fever set in. The author believes that the fever was caused by the setting free, with the blows of the chisel, of septic material, which was present in the sinus or cerebellar abscess, as the wound healed smoothly. The signs of a brain abscess (chills, fever, tenderness on percussion, vertigo, stupor, papillitis, slowed pulse) became more marked, and in the absence of aphasia, and paralysis of the extremities, MÜLLER made the probable diagnosis of cerebellar abscess. Ten weeks after the operation, a trephine opening was made with the rotating saw, half-way between the occipital protuberance and the mastoid process. A knife was put in the cerebellum, but without result; a dressing forceps was then introduced, and a teaspoon of pus evacuated. Patient recovered, and was healed after three months.

Müller recommends this site for seeking a cerebellar abscess rather than proceeding back from the mastoid wound and risking the danger of wounding the sinus. The opening should be small (3 by 1.5 *cm*), and does not require the carrying of a protecting cap. The author objects to introducing the finger in the abscess cavity, and recommends the use of the dressing forceps.

NOLTENIUS.

324. GRADENIGO reports the case of a man, thirty-two years old, where the autopsy revealed gangrene of the lung, and a septic thrombosis of the sinus, though the latter contained circulating

blood at time of operation. During the first days of treatment, the exposed sinus did not pulsate when the patient was on his back, but when the head was raised extensive pulsation became evident, as if the blood passed in large waves, perhaps on account of the partial patency of the lumen. GRADENIGO.

325. SCHMIDT reports eight cases of otitic pyæmia, of which six were not operated upon. The first died without operation or autopsy. The symptoms pointed to the perforation of the epidural abscess into the skull, and fatal carotid hemorrhage. The second and third recovered without operation. In the latter from the symptoms a central pneumonia cannot be excluded, though Schmidt believes that a phlebitis of the transverse sinus existed, with embolus in the lung. The fourth patient was operated on (a solid thrombus in sinus, heavy hemorrhage on its removal); death in forty-eight hours. No autopsy. Death supposed from pyæmic intoxication, without pronounced meningitis, possibly meningitis serosa. In the fifth case a solid thrombus was present, removed without hemorrhage. Death three days later. Post mortem showed hyperæmia with œdema of brain. Incipient meningitis. Schmidt regards this also a serous meningitis. The remaining three cases recovered after operation. Case 6: The transverse sinus contained fluid blood, pyæmia continued for seven days after operation, and the pyæmic focus probably was situated in the bulb of the jugular vein. Case 7: No pus in antrum. Puncture of sinus, fluid blood there, trephining after v. Bergmann; also without avail. The tip of the mastoid was then removed; it contained a small sequestrum, and some muco-pus. The focus of the pyæmia was not found, as the chills, etc., continued for thirty days. Case 8: Antrum empty, the sinus does not pulsate, its wall is discolored, and contains a solid thrombus, with signs of breaking down. During the after treatment profuse suppuration from the bulb, and later transient facial paresis.

The author is a partisan of the Stacke operation, and is opposed to the generalization of v. Bergmann's procedure in cranial complications after otitis to open the skull primarily over the tegmen tympani and from there to enter the middle ear. On this point most otologists probably agree with him. NOLTENIUS.

d.—OTHER DISEASES OF THE MIDDLE EAR.

326. CONNALL, J. G. Rupture of the tympanic membrane with clonic spasm of the facial muscles in a diver. *British Medical Journal*, September 10, 1898.

327. TRAUTMANN, G. A case of foreign body in the Eustachian tube. *Münch. med. Wochenschr.*, No. 47, 1898.

328. HEIMANN, T. On progressive deafness. *Wiener klin. Rundschau.*, Nos. 48-52, 1898.

329. HARTMANN, E. Bony ankylosis of the stapes in the oval window, with report of four new cases. *Inaug. Diss.*, Bâle, 1898.

330. FARACI, G. Results after mobilizing the stapes. *Arch. ital. di Otolg.*, etc., vol. vii., p. 129.

331. FARACI, G. A new way to mobilize the stapes. *Ibid.*, p. 313.

326. A diver was knocked off the ladder as he was descending and fell to the bed of the river. A severe pain was immediately felt in the right ear and all over the side of the face. Inflammatory middle-ear symptoms then supervened. About twelve hours after the accident, violent, painful, spasmodic contraction of all the right facial muscles occurring every few seconds came on. This condition was immediately arrested on politzerisation.

ARTHUR CHEATLE.

327. Otorrhœa for one year. Burning sensation in the neck. Eustachian orifice swollen. In lower anterior quadrant of drum membrane, oval perforation. Syringing the ear canal evacuated a cherry pit into the pharynx; the opening of the Eustachian tube then appeared gaping.

SCHEIBE.

330. The results of mobilizing the stapes as regards hearing were satisfactory in four of eight patients and poor in the remainder. Disturbances of equilibrium were more affected than the subjective noises.

GRADENIGO.

331. With the bone forceps a segment of the tympanic sulcus is resected from the meatus to expose the stapes. Bands and fibrous adhesions in the niche of the oval window are then divided. No mention of final results.

GRADENIGO.

NERVOUS APPARATUS.

332. FINLAYSON, JAMES. The diagnosis during life of retinal and labyrinthine hemorrhages in a case of splenic leukæmia. *British Medical Journal*, December 31, 1898.

333. LERNER. On tabic deafness. *Monatschrift f. Ohrenheilk.*, No. 10, 1898.

334. SMITH, G. C. Menière's disease. *Boston Med. and Surg. Journ.*, November 24, 1898.

332. A woman aged twenty-nine, suffering with leukæmia, became very deaf in both ears after an attack of severe giddiness and nausea. Barr, who examined the case for the aural trouble diagnosed "exudation in the cavities of the labyrinth, probably hemorrhagic in character." After death examination of the internal ear showed hemorrhages in the vestibule and first turn of the cochlea, the middle ears being normal. CH.

333. After reviewing the literature LERNER gives a detailed account of a case of sudden, bilateral total deafness in tabes, where a careful examination lead to the diagnosis of a tabic disease of the auditory nerves. KILLIAN.

334. The patient, a man, sixty-two years of age, of fairly good health, while sitting one evening in conversation, suddenly felt as though he was seized by some power and hurled a considerable distance, striking against the left side. He was unconscious for the moment but arose with assistance. He was unable to walk on account of vertigo and had to lie down. This was followed by vomiting and vertigo, which continued all night. There was also a hissing tinnitus and on the following day there was deafness in the left ear. He was treated at first for biliousness and had no further trouble for five weeks, when he had a similar, but milder, attack. He was also treated by the Salisbury method and his weight reduced thirty-eight pounds in five months. During this time he had six seizures similar to the last one. During all this time the noises in the head were continuous. The deafness, though incomplete, never improved after the first seizure.

GORHAM BACON.

NOSE AND NASO-PHARYNX.

a.—GENERAL PATHOLOGY.

335. GROSHEINTZ. On the relation between hypsistaphylia and leptoprosopia; a contribution to the etiology of the vaulted palate. *Inaug. Dissert.*, Bâle, 1898, and *Arch. f. Laryng.*, vol. 8, No. 3.

336. MEISSER. Chamæprosopia an etiological factor in manifest ozæna. *Inaug. Dissert.*, Bâle, 1898.

335. GROSHEINTZ made accurate craniometric measurements in sixteen racial skulls with high, narrow palates, and found that hypsistaphylia coincides with leptoprosopia, *i.e.*, with the narrow face and narrow nose. The high palate does not, as Bloch thinks, necessarily presuppose preceding or existing hypoplasia of the

pharyngeal tonsil, etc. The author's measurements do not refute or render improbable the view shared by most rhinologists that, aside from heredity, a high palate may be caused by nasal obstruction.

BOENNINGHAUS.

336. From measurements of forty patients with ozæna, MEISSER finds that congenital width of the nose is an etiological factor in ozæna, though not the only one, as only a small part of the chamæprosops (*χαμαι* = low) are affected with ozæna. A second factor is the metaplasia of cylindrical to squamous epithelium, which is not the result of the suppuration, as previously supposed, but precedes the latter process, which is the most important result of the research. In two cases of one-sided ozæna he found the middle turbinate on the non-atrophic side, but narrowed by a deflected septum already covered with pavement epithelium.

BOENNINGHAUS.

b.—METHODS OF EXAMINATION AND TREATMENT.

337. MAYER, EMIL. On the use of Schleich's mixture in operations of the nose and throat. *N. Y. Med. Four.*, October 15, 1898.

338. SIMPSON, W. K. The use of the Bernays' aseptic sponge in the nose and naso-pharynx. *N. Y. Med. Four.*, October 1, 1898.

339. HANSEL. Therapeutic notes. *Weiner klin. Wochenschr.*, No. 49. 1898.

340. BREITUNG. Sterile mops for operations in the nose and throat. *Monatschr. f. Ohrenheilk.*, No. 11, 1898.

337. MAYER has used Schleich's mixture II. in twenty-one and mixture I. in forty-nine operations of the nose and throat, and has found it to give an exceedingly satisfactory anæsthesia without a stage of excitement, with increase of the tension of the pulse and rapid return of consciousness, which insures a safeguard against post-operative hemorrhage. There was vomiting in six cases. Only in one case of ethmoiditis Mayer had to substitute ether. (Rodman reports, in the *Medical Record*, October, 1898, the experience of the Schleich anæsthesia in the Mount Sinai Hospital, which was not satisfactory to the surgeon. The reviewer has used the Schleich mixture without petroleum ether, and found it excellent in operations of brief duration.)

M. TOEPLITZ.

338. The Bernays' aseptic sponge is composed of prepared

cotton fibre, subjected to many hundred pounds of pressure, in the shape of circular discs of $\frac{1}{8}$ inch in thickness, and possesses great absorptive power, by which it increases very much in size. SIMPSON considers it superior to all known materials used for controlling intranasal hemorrhage, for which it has to be cut in a semicircular form, and inserted with the convexity upward. In postnasal hemorrhage he uses the smallest size of disc with holes in either end for the reception of strings. The sponges are used also as splints in the later stage of the Ash operation, as intranasal dressing, for the prevention of adhesions, for conveying medication, and in atrophic rhinitis. They are manufactured by Johnson & Johnson. M. TOEPLITZ.

339. In Chiari's clinic orthoform proves to be a satisfactory and complete local anæsthetic in ulcerous processes in the upper air passages. Six per cent. iodvasogen was not satisfactory as an application in the nose, while two per cent. mentholvasogen produces some relief in a few cases of chr. hypertr. rhinitis, though generally was not well borne; it gave better results in chronic pharyngitis. Anesin of no value. Airol, traumatol, and xeroform were used as dusting powders and in ten per cent. gauze. Airol proved to be the strongest desiccant; as antiseptics they were equally potent but inferior to iodoform, though there is no odor and no toxicity. POLLAK.

340. Cotton wound on spirally turned glass rods was sterilized. KILLIAN.

c—OZÆNA.

341. GONGENHEIM et LOMBARD. Interstitial cupric electrolysis in ozæna. *Ann. des mal. de l'or., du lar.*, No. 11, 1898.

341. These authors employ a current of 10 milliamperes strength for 10-12 minutes; the positive needle is inserted horizontally in the middle turbinate, the negative being placed in the lower or in the septum. The results due to a stimulating trophic influence consist in the disappearance of the odor. This occurred in 7 out of 30 treated cases; the others are still partly in treatment. ZIMMERMANN.

d—NASAL SEPTUM.

341. DE BLOIS, THOMAS AMORY. Submucous operations on the nasal septum. *N. Y. Med. Journ.*, October 8, 1898.

342. CHEATLE, ARTHUR H. A case of paroxysmal sneezing associated with great hypertrophy of tissues in the neighborhood

of the septal tubercle. *Proceedings of the Laryngological Society*, Nov. 4, 1898.

344. LERMOYEZ. Syphilitic chancre of the nasal septum having a pseudo-sarcomatous type. *Ann. des mal. de l'or., du lar.*, No. 12, 1898.

342. DE BLOIS found, in a case of a young woman suffering from persistent epistaxis, who had been operated upon for a spur of the septum, the mucous membrane absent over a large area of the cartilaginous septum. In treating the borders of the mucosa the denuded cartilage sloughed away until a large perforation was established. After several attempts at grafting mucous membrane taken from the throat, he finally succeeded in partially bridging over the perforation. De Blois, therefore, removes spurs by detaching at first the mucous membrane from below with long-handled dental instruments, bent and ground into knives and gouges, then cutting off the spur with the saw without severing the flap, and finally by attaching the flap with collodion. He has been successful with this method in six cases.

M. TOEPLITZ.

343. A man complained of nasal obstruction and violent attacks of sneezing. On the right side, a pink soft mass, springing from the septum opposite the middle turbinal, extending downwards and forwards, having a broad base with slightly overhanging lower edge, quite obscured the middle meatus and reached down to the inf. turbinal. The same condition existed on the left side but to a less degree.

With a cold snare the larger portion of the mass on the right side was removed. Sections showed great hypertrophy of normal tissue; numerous glands giving an almost adenomatous appearance in parts, with large blood spaces and great increase of connective tissue.

CH.

344. This swelling, occurring at the cartilagenous septum of a man aged twenty-five years, was taken for an old thickening, for an inflammatory swelling, for a hard chancre, for a purulent perichondritis, and for a sarcoma in turn. An operation with temporary resection of the nose was about to be undertaken when a typical roseola appeared. Recovery followed intramuscular injections of calomel.

ZIMMERMANN.

e—ACCESSORY SINUSES.

345. COBB, C. Thirty cases of antral empyema. *Boston Med. and Surg. Journ.*, Dec. 1, 1898.

346. BRYAN, J. H. Further results of operative treatment of chronic frontal sinusitis. *N. Y. Med. Jour.*, Dec. 17, 1898.
347. MORRISON, J. T. J. Fracture of inner wall of orbit into anterior ethmoidal cell. *Brit. Med. Jour.*, Nov. 19, 1898.
348. CHEATLE, ARTHUR H. X-ray photograph of foreign body (silver tube) in the antrum of Highmore. *Proceedings of Laryngological Society*, Dec. 2, 1898.
349. GRANT, DUNDAS. Two cases of empyema of the antrum of Highmore cured by intranasal treatment. *Proceedings of Laryngological Society*, Dec. 2, 1898.
350. STEWART, W. R. H. Cyst of the maxillary antrum. *Brit. Med. Jour.*, Nov. 26, 1898.
351. STEWART, W. R. H. A case of double empyema of the frontal sinus with one infundibulum. *Lancet*, Dec. 10, 1898.
352. HILL, WM. Frontal sinusitis. *Proceedings of Laryngological Society*, London, Nov. 4, 1898.
353. HALASZ. Serous inflammation of the maxillary antrum. *Wiener klin. Rundschau.*, No. 46, 1898.
354. GAVELLO, G. Mucous polyps in the maxillary antrum. *Arch. ital. di Otologia*, vol. vii., p. 82.
355. GONLY. Diagnosis of frontal empyema. *Arch. intern. de lar., d'otol.*, xi., 5.
356. MEYJES. Report of a case of probable pneumatocele of the frontal sinus. *Monatschr. f. Ohrenheilk.*, No. 10, 1898.
357. FURET. Frontal empyema discharging into the maxillary sinus. *Arch. intern. de lar., d'otol.*, xi., 6.
345. All cases due to dental causes heal most readily by cleansing washes only. Teeth with diseased crowns but sound roots may give rise to antral empyema. Where no tooth appears to be the cause, the X-ray will show the existence of an old carious root in the alveolus. Two of the dental cases contained foreign bodies, loose pieces of rubber, and a twelve-year molar respectively. In all ten dental cases the removal of the carious teeth promptly relieved the empyema. Seven acute cases were due to catarrhal causes and lasted from three to four weeks on the average. The opening of one antrum did not accelerate the cure. Four cases were syphilitic with foul discharge due to necrosis and sequestra. One case was malignant, a sarcoma. In seven cases ethmoid disease was associated with antral suppura-

tion, which was cured in two cases by turbinotomy and removal of polypi only. One case only was plainly due to nasal obstruction from polypoid growths.

M. TOEPLITZ.

346. BRYAN reports two cases, the first of a young man *æt.* eighteen, the second of a young woman *æt.* twenty-two. The first presented after influenza a swelling at the left inner canthus, which when incised evacuated pus and left a fistula for five months; the latter was then enlarged, the frontal sinus curetted, drainage tube introduced into the nasal duct, and outer opening closed after irrigation of the sinus from the nose. Complete recovery took place. The second case presented under excruciating headaches a cleft in carious left middle turbinate which discharged pus. The turbinate and carious ethmoid cells were thoroughly removed through the nose. The septum between the frontal sinus soon broke down, as could be recognized from sanguinolent discharge from the right nostril. The bone above the left supraorbital ridge was then trephined, the frontal and ethmoidal cells were curetted, caries and septum removed, and the cavity was packed and drained. After the opening of a secondary subperiosteal abscess, the patient was much improved.

M. TOEPLITZ.

347. At a meeting of the Midland Medical Society, held November 2, 1898, MORRISON showed a man, aged twenty-four, who, on October 4th, had been kicked on the upper and inner angle of the left orbit by a pony. Soon after the injury, both the left eyelids began to swell, and some hours later the swelling greatly increased when the patient was blowing his nose, and a little blood-stained mucus came from the left nostril. On October 7th, there was considerable emphysema of the left eyelids. There was some proptosis. Recovery.

CHEATLE.

348. The patient had been wearing a tube through the canine fossa for chronic antral suppuration. The top broke off the tube, but the patient continued to wear it. One morning, on waking, it had disappeared. A photograph taken by Low clearly showed the tube lying across the cavity, high up and close to the nose.

CHEATLE.

349. In the first case GRANT obtained a cure by irrigating the cavity with Lichtwitz's instrument. Fetid discharge had been present for four weeks. In the second, anterior turbinectomy and puncture with Krause's trochar and canula, followed by 12 irrigations, effected the cure; the fetid discharge in this case had lasted continuously for six months.

CHEATLE.

350. A patient, aged thirty-two, came under STEWART's care in July, 1898, with a history of a swelling which had appeared four years before, below the left eye, with frequent pain. It had remained in same condition until twelve months ago, when a fulness was felt in the mouth; latterly this had increased a good deal. Fluctuation was easily felt between the roof of the mouth and the front of the antrum. Antrum opened in canine fossa, and the very much thinned outer wall removed. Contents found to be clear, glairy fluid, like white of egg, containing white, glistening crystals of cholesterine. Cavity scraped. Tube inserted. Daily antiseptic washing. Cure. CHEATLE.

351. A woman, aged twenty-nine years, suffered with polypi, and discharge from the left side of her nose. STEWART opened left frontal sinus through the brow incision; he then found the septum well over to the left side, with a small hole posteriorly through which pus came. The incision was then continued across the nasal bones on to the right eyebrow. The right sinus was found to have no infundibulum, but opened by the small hole in the septum into the left. CHEATLE.

352. HILL showed a man, aged forty years, on whom he had recently performed the Ogston-Luc operation for chronic suppuration of the frontal sinus. No drainage was employed, and the scar of the short brow incision was scarcely visible.

CHEATLE.

353. HALASZ saw ten cases of serous inflammation of the maxillary sinus. The diagnosis was made from the severe pain at malar bone, the root of the nose, and in the supraorbital region. Aspiratory puncture with Noltenius' trochar confirmed the diagnosis; the fluid was drawn off with a syringe. POLLAK.

354. During an operation for empyema of the maxillary antrum, numerous polyps were found. This is the eighth case on record. GRADENIGO.

355. GONLEY reviews the usual diagnostic items depending on the pain, the rhinoscopic condition, and the result of transillumination. ZIMMERMANN.

356. The frontal sinus was distended, but otherwise normal. The anterior bony wall was as thin as paper. MEYJES regards a closure of the nasal opening as the cause, though he does not explain how such a closure leads to increased intrasinus pressure and consequent distension. KILLIAN.

357. FURET finds a proof in his case for the fact that in most

cases the frontal empyema is primary, and the maxillary sinus becomes affected secondarily and at a later period.

A patient, twenty-nine years old, complained of pain over and below the left eye, and purulent discharge from the nose. An empyema of both the frontal and maxillary sinuses was found present. The frontal sinus was opened, and contained pus and granulations. The maxillary antrum was irrigated for one week through the aspiratory opening in the nose. Both cavities were healed, and the cure was verified three months later. A second case is reported where the antrum of Highmore was healthy, and simply contained pus escaping from the frontal sinus.

ZIMMERMANN.

f—OTHER AFFECTIONS OF THE NOSE.

358. COOLIDGE, A., JR. Cerebro-spinal fluid from the nose. *Boston Med. and Surg. Jour.*, Nov. 17, 1898.

359. REARDON, TIMOTHY J. Osseous cysts of the middle turbinate. *Boston Med. and Surg. Jour.*, Dec. 8, 1898.

360. WINGRAVE, WYATT. Spreading ulcer of the nose. *Proceedings of Laryngological Society*, Dec. 2, 1898.

361. CHEYNE, WATSON. Repair of the bridge of the nose by rabbit bone. *British Med. Jour.*, Nov. 5, 1898.

362. LACK, H. LAMBERT. Fibrinous or membranous rhinitis, and its relation to diphtheria. *British Med. Jour.*, Oct. 29, 1898.

363. BOWLBY, A. Hyperostosis of maxillary and other bones, causing nasal stenosis. *Proceedings Laryngological Society*, Dec. 2, 1898.

364. NIKITIN. Clinical cases. *Monatschr. f. Ohrenheilk.*, No. 12, 1898.

365. LACROIX. A case of nasal vertigo. *Arch. intern. de laryng., d' otol.*, xi., 5.

366. BERNOND. Cystic degeneration of the two middle turbinates; multiple mucous cysts. *Ann. des mal. de l'or., du lar.*, x. 1898.

367. AVELLIS. Tuberculosis of the upper jaw in children, simulating maxillary empyema. *Münch. med. Woch.*, No. 45, 1898.

368. MEYJES. A case of a tooth inverted in the nose. *Monatschr. f. Ohrenheilk.*, No. 10, 1898.

369. LOSSEN. Rhinoplasty with use of a prothesis. *Munch. med. Woch.*, No. 48, 1898.

358. In a boy, æt. thirteen, watery fluid dropped constantly after a violent cold, for five years, from the right nostril, one drop every five seconds, whenever the head was well bent forward or turned upon the face. There was no dropping into the throat nor into the nose when the head was erect. The fluid came from the upper part of the nose. After half an hour's flow, the patient complained of a headache. The fluid was found to be of the same composition as cerebro-spinal fluid.

359. REARDON collected forty-one cases of cysts of the middle turbinate, among which eleven were observed by anatomists, and thirty, including his own, of which he gives a full report, by clinicians. They occur not only in female adults, as obvious from all clinical cases, but also in young girls; they have been occasionally observed in skulls of old men. The microscopical examination revealed: the mucosa to be normal, the cavernous tissue most thick near the bone, covered by a layer of osteoid cells with thickened periosteum internally, detritus of crystals and fat above without a lining mucous membrane. REARDON believes the cysts to be congenital, not due to suppuration, but to ectasia of the ethmoid, or to an aberrant ethmoid cell which developed in the turbinate. The osteophytic changes are produced to reinforce the bony layer against the increasing pressure. A complete bibliography is appended.

M. TOEPLITZ.

360. A man aged fifty, a laborer, was first seen by WINGRAVE on November 14, 1897, when he complained of pain over the nose and stinking discharge of six weeks' duration. On examination, both sides of the nose were full of fetid crusts which on removal showed perforation of the vomerine region of the nasal septum with granulation tissue in all directions. Syphilitic history thirty years previously.

In January, 1898, a red patch appeared on the outside of each ala at the junction of the bone and cartilage; breaking down and ulceration rapidly occurred, the ulceration spreading to the cheeks and upper lip. Pain was considerable and the discharge profuse and fetid. Iodide of potassium and inunction of mercury produced no effect. Bacteriological and microscopical examination gave nothing definite. Injections of mallein and tuberculin produced no reaction. There had not been marked

loss of flesh. The temperature had sometimes been 103° , but for the last six weeks had been about normal. The disease was still progressing.

ARTHUR CHEATLE.

361. At a meeting of the Clinical Society of London, held on October 28th, WATSON CHEYNE showed a youth who, eight years ago, met with an accident through which he lost a large portion of his nasal bones. In January, 1898, a flap was raised from the right side of the nose, exposing the periosteum. The femur was then removed from a rabbit, split into five or six pieces, and simply laid on the periosteum. The flap was then replaced. The wound healed without suppuration; the result being excellent.

CHEATLE.

362. At a meeting of the Royal Medical and Chirurgical Society, held on October 25th, LACK read an interesting paper on this subject.

The disease was stated as being present in $2\frac{1}{2}$ per cent. of all the children attending the author's hospital practice. A brief analysis was given of the symptoms presented by 36 cases, and the results of bacteriological investigation was reported in 33. The Klebs-Loeffler bacillus was constantly present, generally in pure culture, sometimes mixed with pyogenic cocci, *sarcinæ*, etc.; it was usually of the large variety, and its identity was proved by its morphology, and by its growth on various culture media, etc. It was also shown to be full of virulence in animals, to produce virulent toxins, and to be neutralized by antitoxins. Further it was shown to be capable of living for several months on culture media, and by its vigorous growth to crowd out other organisms if present. A previous history of diphtheria was found in connection with one case only. The disease was found to be very infectious in its own form (9 cases occurred in 4 families), and as a mild sore throat (25 instances occurred in 11 families). The Klebs-Loeffler bacillus was also found in healthy throats, in association with these cases.

The conclusion was arrived at that fibrinous rhinitis was a mild variety of diphtheria, the difference in the clinical manifestations apparently depending on some differences in the organisms associated with the Klebs-Loeffler bacillus. Paralytic symptoms had not been observed in any of the cases.

ARTHUR CHEATLE.

363. BOWLBY's case was a woman, aged forty-three, who had noticed nasal obstruction and pain for about eighteen months.

On examination there was exophthalmos, especially on the left side. The left temporal fossa was occupied by a bony growth which was continuous with an enlargement of the left malar and superior maxillary bones. The left supraorbital ridge was thickened. Both maxillary bones showed overgrowth of their nasal processes, but the nasal bones were not enlarged. There was a bony growth in the floor of each nostril covered by smooth mucous membrane, and as large as a large almond. The turbinate bones also appeared enlarged. The palate bones, the alveolar processes of the maxillæ, and the lower jaw were normal. The etiology was not clear.

ARTHUR CHEATLE.

364. CASE 1. Nasal hydrops. Chronic rhinitis and adenoids. Fluid dropped steadily from the nose; ceased upon removal of adenoids and administration of extr. hydragr.

CASE 3. Bilateral abscess of cartilaginous nasal septum, probably after influenza. No trauma.

365. LACROIX removed three large mucous polypi from the nose of a patient who had been suffering from attacks of vertigo. These attacks have now ceased for a period of two months after the operation.

ZIMMERMANN.

366. In a man, sixty-seven years old, both middle turbinates were covered with large cystic formations, causing obstruction and anosmia. They were retention cysts and contained mucus.

ZIMMERMANN.

367. Suppurating fistula beneath lower eyelid, from which a sequester has been cast off. Purulent discharge from the nose containing tubercle bacilli, and caries in the lower meatus. AVELLIS has collected three additional cases with similar symptoms in nursing babies, where the diagnosis of empyema had been made, probably incorrectly, as the maxillary antrum is but $\frac{1}{2}$ mm deep at the fourth month.

SCHEIBE.

368. A canine tooth projected into the nose.

KILLIAN.

369. LOSSEN reports a case and describes his method of fitting a prosthesis.

SCHEIBE.

g.—NASO-PHARYNX.

370. COOLIDGE, A., JR. Tumors of the naso-pharynx. *Boston Med. and Surg. Jour.*, Nov. 17, 1898.

371. CHEATLE, ARTHUR H. Section of cyst removed from the naso-pharynx. *Proceedings of the Laryngological Society*, Dec. 2, 1898.

372. CASSIANI-INGONI. The importance of adenoids in the etiology of ear disease. *Arch. ital. di Otol.*, vol. vii., pp. 24 and 186.

373. ARSLAU. The neoplasms of the naso-pharynx. *Arch. ital. di Otol.*, vol. vii., pp. 33 and 161.

374. LICHTWITZ. The rapid extirpation of naso-pharyngeal pseudo-polyps. *Arch. intern. de lar., d' ot.*, xi., 6.

375. BLISS, ARTHUR AMES. The recurrence of naso-pharyngeal adenoids after operations of excision. *N. Y. Med. Jour.*, Oct. 29, 1898.

370. Two boys, aged sixteen, mouth-breathers, had the naso-pharynx filled with a *hard smooth tumor* attached to the basilar process, and with a nasal prolongation in the right and left nostril respectively. They were slowly cut off with stout wire introduced over the nasal tumor and placed around the base; in one of these a previously introduced nasal sponge was left for thirty-six hours. One tumor was a *hard vascular fibroma*. A year later the pedicle had disappeared and the sphenoid cavity could be directly inspected through a large opening on the right side. The other tumor was a fibro-sarcoma. The pedicle did not shrink, but slowly increased and was removed with the *écraseur*. When left alone the stump slowly decreased, but is still plainly visible.

M. TOEPLITZ.

371. A man, aged nineteen years, came complaining of nasal obstruction. Besides some turbinal hypertrophy and a spur in the nose, a smooth pink mass the size of half a walnut was seen immediately behind the septum and stretching from one Rosenmüller's fossa to the other. Under chloroform it felt tense and was ruptured with the finger-nail before removal. A microscopical section showed a large and a small cyst, each lined with columnar ciliated epithelium, with a slight amount of adenoid tissue outside on the cut surface.

CHEATLE.

372. Noticeable are three cases of the author's of deaf mute children where the result of the operation in regard to hearing was excellent.

GRADENIGO.

373. ARSLAU has collected 121 cases, of which 21 are his own. Frequency, symptoms, and operation methods are discussed.

GRADENIGO.

374. LICHTWITZ calls pseudo-polyps those benign growths with thin fibrinous pedicle springing from the neighborhood of the choanæ. He has observed seven cases of all sizes, with pro-

longations into one or both nasal cavities. He usually operates with Lange's hook, and twice from the mouth. ZIMMERMANN.

375. BLISS has seen nine cases of recurrence of adenoids after their removal: three of his own, one four, one two, and one a year after operation. The second operation removed in two cases some vegetations from the region about the wings of the vomer at their articulation with the vaginal process of the sphenoid, and sphenoidal processes of the palate bones, which, according to Harrison Allen, do not always completely unite, the open areas being filled with vascular tissue. The recurrence of adenoids, as a result of their incomplete removal, is caused by an inflammatory process in parts which have remained. In radical operations, therefore, the parts lying well forward at the vomero-sphenoidal articulation, and the lateral ones above the Eustachian orifice and in Rosenmüller's fossæ should be thoroughly removed.

M. TOEPLITZ.

SOFT PALATE, BUCCAL CAVITY, AND PHARYNX.

376. BOND, J. Large lipoma of soft palate. *Proceedings of Laryngological Society, London*, Nov. 4, 1898.

377. WINGRAVE, WYATT. Preparations of hypertrophied tonsils. *Proceedings of Laryngological Society*, Dec. 2, 1898.

378. WAGGETT, ERNEST. Varix or nævus of the posterior faucial pillar. *Proceedings of Laryngological Society*, Dec. 2, 1898.

379. KEIPER, GEO. F. Albuminuric tonsillitis. *The Laryngoscope*, Nov., 1898.

380. MALHERBE. Chronic pharyngeal catarrh and its treatment with the curette. *Arch. intern. de lar.*, xi., 5.

381. FARACI. Surgical treatment of chronic hyperplastic pharyngitis. *Arch. ital. di Otologia*, vol. vii., p. 7.

382. BOUCHERON. Retropharyngeal abscess in a child of thirteen months. Antistreptococcic serum. Recovery. *Arch. intern. de lar.*, xi., 5.

383. BERGRAT. Mucous patches on the post-pharyngeal wall. *Münch. med. Wochenschr.*, No. 47, 1898.

376. Patient, aged forty years, with a large, semi-fluctuating tumor in soft palate on right side, extending to the left side beyond the mid-line, and on the right behind the angle of the jaw. Eight years ago BOND had removed a large, many lobed fatty tumor, through an external incision, from the parotid region.

CHEATLE.

377. WINGRAVE's microscopical sections were arranged for macroscopical inspection. They illustrated the conditions of simple hypertrophy without inflammatory changes. The points of chief interest were, the scantiness of the connective-tissue elements, the depth of the lacunæ, which reached to the "bed" of the tonsil, and the fact that one aperture was common to several lacunæ. The tonsils, before cutting, had been soaked in collodion, which binds the tissues together and prevents the lymph-follicles from falling out. CHEATLE.

378. WAGGETT showed a young man in whom a knot of dilated veins were present under the mucous membrane of the left posterior faucial pillar, connected above with a small nævoid patch, occupying the surface of the upper part of the corresponding tonsil. The condition was probably congenital. CHEATLE.

379. KEIPER reports the case of a man, æt. thirty-two, with albuminuric nephritis. At the upper portion of the left tonsil an ulcer of the size of a dollar, covered with an exudate resembling diphtheria, was observed, the ground of which appeared as scooped out with a sharp spoon. Treatment with a 12½-per-cent. solution of nitrate of silver produced moderate bleeding. Another hemorrhage was more severe. M. TOEPLITZ.

380. MALHERBE operates on obstinate naso-pharyngeal catarrh in adults with remnants of hypertrophy of pharyngeal tonsil with the curette in bromethyl narcosis, with overhanging head. Seven cases are reported. ZIMMERMANN.

381. Description of an instrument to scarify the pharyngeal wall. GRADENIGO.

382. A very much debilitated child, thirteen months old, presented a fluctuating swelling, extending from the base of the skull to the level of the palate. Suppurating glands of the neck; these were opened, and a pure culture of streptococcus was found in the pus. Antistreptococcic serum was then injected. Four days later, the retropharyngeal abscess on palpation emptied itself through the wound of the cervical glands. The spontaneous recovery was due more to the evacuation of the abscess than to the serum. The cause of the abscess is supposed to be a lymphadenitis after influenza and rhinitis. ZIMMERMANN.

383. Five vertical ridges in the mucous membrane with clouding of the epithelium; the upper ends are indistinct, while the lower ends are rounded. Several other patches on the faucial tonsils and at the base of the tongue. No history of syphilis. Recovery after mercurial inunctions. SCHEIBE.

BOOK REVIEWS AND NOTICES.

I.—**The American Text-Book of Diseases of the Eye, Ear, Nose, and Throat.** Edited by G. E. DE SCHWEINITZ, and B. ALEX. RANDALL, M.D., Clin. Prof. Otology, Univ. of Penna. 1251 profusely illustrated octavo pages. M. B. Saunders, Philadelphia, 1899. \$7.00 *net*.

The ear occupies 188 pages. The first article is by Randall, on the "Anatomy of the Ear, Including Embryology and Histology," 17 pages, with numerous, mostly original, drawings. This article is excellent, and shows the well-known mastery of the author in this laborious field of scientific labor. The second article, "The Physiology of the Ear," by Frank Allport, though short, goes deeper into the subject than many text-books do. The third article, "Etiology and Pathology," is by C. R. Holmes, of Cincinnati; the fourth, "Examination of Patients, the Hearing Tests, and Otoscopy," by J. E. Sheppard, of Brooklyn; the fifth article, "General Therapeutics of Ear Affections," by Cl. J. Blake, of Boston, short and to the point. Then come: "The Affections of the External Ear," by Sam. Theobald, of Baltimore; "Injuries and Diseases of the Drumhead," by H. V. Würdemann, of Milwaukee, with twenty-four brilliantly (!) colored drumhead pictures; "Chronic Catarrh of the Middle Ear," by E. B. Dench, of New York; "Chronic Suppuration of the Middle Ear," by Alb. H. Buck, of New York; "The Complications of Tympanic Inflammation, Mastoid and Intracranial Affections," by Herman Knapp, of New York; "Diseases of the Sound-Perceiving Apparatus," by Hy. A. Alderton, Brooklyn, quite an elaborate presentation; "Operations," by J. Orne Green, of Boston, including the operations for intracranial complications, excellent.

Part III., 374 pages, the **nose** and **throat** is treated of by nineteen authors, very well selected for the subjects allotted to

them—for instance, H. Allen and A. A. Bliss, anatomy of the upper air passages; J. H. Bryan, general etiology and pathology; M. E. Casselberry, acute affections of the nose; M. J. Asch, chronic affections of the nose; R. C. Myles, accessory sinuses; etc.

This American text-book, as we have said in reviewing the ophthalmological part, is prepared with great care and judgment both on the part of the editors and contributors. It is highly to be recommended, and cannot fail to be popular, as there is a large and constantly growing number of men choosing for their life-work the study and practice of ophthalmology on the one hand, or otology, rhinology, and laryngology on the other, or some other combination or restriction, according to their taste, aptitude, and working power.

H. K.

II.—L'Audition et ses Organes. By Dr. M. E. GELLÉ. Félix Alcan, Paris. 1 vol. in 8°, illustrated. 1899. Price fr. 6.

This is a neat and very well-written volume of 324 pages, with many engravings, on physical and physiological acoustics. The laws of sound, the sonorous vibrations the excitant of audition, 132 pages; the auditory organs, peripheric organs, acoustic centres of animals and man, and the intricate nervous auditory paths are well described. The book closes with the auditory memory, obsessions and hallucinations of hearing, and colored audition. Any thinking, educated man, especially an aurist, who can make the time to study this work, will have a high intellectual enjoyment and a valuable addition to his stock of mental property.

H. K.

III.—Electricity in the Diagnosis and Treatment of Diseases of the Nose, Throat, and Ear. By W. SCHEPPE-GRELL, M.D., New Orleans, La. Octavo, 403 pages, 161 illustrations. G. P. Putnam's Sons, New York, 1898. Price \$4.50.

The author dwells on the necessity of sufficient knowledge and mechanical skill in electro-physics to use the resources of electro-physiology and electro-therapeutics to advantage. He explains the principles and theories of the various manifestations and laws of electricity, describes the machines, instruments, and apparatus, goes minutely into the details of the appliances used in medicine, omits nothing that can be of benefit in diagnosing and treating the diseases of the nose, ear, and throat, so that the book will be as good for reference as for introduction into this branch of

medicine. The number of subjects in which electricity may be used for diagnostic and curative purposes is very great. Transillumination is, of course, fully detailed, and even the X-rays receive due consideration in three chapters. The numerous and excellent figures are a great help in clearing up many points difficult to understand. The book can be highly recommended.

H. K.

IV.—Chirurgie Opératoire de l'Oreille Moyenne (Operative Surgery of the Middle Ear). By A. BROCA, Surgeon to the Hôpital Trousseau, Prof. agrégé à la Faculté de Médecine de Paris. Octavo, 199 pages, 98 figures. Masson & Cie., 120 Boul. St. Germain, 1899. Frs 3.50.

The author, very favorably known by two larger works which we have reviewed in these ARCHIVES: the one, A. BROCA et F. LUBET-BARBON, *Les Suppurations de l'Apophyse Mastoïde et leur Traitement* (year 1895, p. 250); the other, A. BROCA et MAUBRAC, *Traité de Chirurgie Cérébrale* (year 1896, p. 337), comprehends the topographical anatomy and operative surgery of the mastoid process in a compendium serving as a guide not only to the aural but also to the general surgeon. The presentation of the anatomy of the mastoid is supplemented by an atlas of 50 figures, photographs taken from dry specimens and explained by his pupil, M. CH. MILLET, furthermore drawings of anatomical specimens dissected and drawn by O. LENOIR, interne des hôpitaux. The description of the operations is illustrated by many half-diagrammatic figures drawn under Mr. Broca's supervision by Mr. DEVY. The anatomical specimens are taken from infants up to old people, showing the differences which age causes in the temporal bone, and which are quite important for the operator to know. The object of the little book is entirely practical.

H. K.

V.—Die eitrigen Erkrankungen des Schläfenbeins (The Purulent Diseases of the Temporal Bone Described from Clinical Experience). By Prof. OTTO KÖRNER, of Rostock, Germany. Large-octavo, 153 pages, with 3 heliotype plates and 20 text figures. J. F. Bergmann, Wiesbaden, 1899.

This monograph appears as No. 1 of a series to be published under the title, "Die Ohrenheilkunde der Gegenwart u. ihre Grenzgebiete" (The Diseases of the Ear and its Adjacent Parts). It resembles in spirit, style, and shape the author's admirable mono-

graph, *The Otitic Diseases of the Brain, its Meninges and Sinuses*, of which, three years after the first edition, a second appeared in 1896.

The present treatise begins with an anatomical introduction on the peculiar conditions which are of importance to understand the origin and propagation of suppuration in the temporal bone, and always have to be borne in mind during operations. Seven very fine photographs illustrate these conditions. The examination of the patient and considerations on operations of the mastoid conclude the general part.

The special part begins with the diseases of the temporal bone by the usual pus cocci.

A. Acute Otitis and Osteomyelitis.—The symptoms are concisely and attractively detailed. The complications are derived chiefly from 81 successive mastoid operations (chiselling into antrum and exposing all further foci of suppuration and decay), which showed: (1) The destruction of the bone had penetrated into the sulcus sigmoideus in 17 cases, (21 per cent.) of which 3 cases with sinus phlebitis, 2 fatal; (2) it had penetrated into the middle cranial fossa in 6 cases (7.4 per cent.), of which one died from lepto-meningitis. Of the 15 cases with intracranial complications, 6 were without a single external symptom indicating the bone affection. The author considers *percussion of the bone* a valuable symptom of diagnosis, and gives a tabular synopsis of 11 cases, in 10 of which the dulness of the percussion tone was manifest and the supposed internal mastoiditis confirmed by the operation. One case was unavailable: diabetic coma, no operation; death, no autopsy.

The reviewer heartily agrees with the author's treatment of acute otitis media. Above all the patient has to keep his bed. As soon as the trias—fever, pain, and bulging of the drumhead—is present the drumhead should be incised. No inflation by any method; syringing only in exceptional cases where tenacious mucus sticks to the canal. No local treatment (leeches, tincture of iodine, and the like) of the mastoid, excepting the ice-bag. As regards the application of cold to inflamed mastoids, several New York aurists, the reviewer included, have abandoned the Leiter coil and all applications of cold, since in many cases they found out that the cold, though grateful to the patient, only masked the inflammation and retarded the proper treatment—the operation.

The operative procedure of the author is the one now prevalent

all the world over. His results in the 81 successive acute cases have been : 5 unavailable, being lost sight of ; 4 fatal, 3 of which by complications present at the operation—that is, the operation came too late ; undisturbed recovery of the osseous wound in 57 cases, after-operations necessary in 14. Follows a short description of necrosis of the labyrinth.

B. Chronic Otitis of the Temporal Bone.—Introduction : osteosclerosis of the mastoid. Then follows (a) : The description of a chronic otorrhœa without entrance of epidermis into the middle-ear cavities. The author performs the “ radical operation ” only when the bone is manifestly diseased, drawing the indications narrower than Stacke and many others do. He rejects the so-called prophylactic operations.

(b). Otorrhœa with entrance of epidermis into the middle-ear cavities (otit. med. desquamativa, pseudo-cholesteatoma) and the true cholesteatoma. The author distinguishes with Kuhn and others these two forms of epidermic formations in the temporal bone, the latter, the true cholesteatoma, being a heteroplastic formation, originating in embryonic life.

(c). The isolated necrosis of the cochlea, usually complicated with facial paralysis, is mostly fatal.

The monograph concludes with chapters on tuberculosis, actinomycosis, and malignant tumors of the temporal bone, and some remarks on hysterical symptoms simulating disease of the temporal bone, the so-called mastoid neuralgia.

This newest monograph of Körner, though far from being an exhaustive treatise, gives a concise, objective, judicious, and rather conservative presentation of the suppurative diseases of the temporal bone, based chiefly on personal observation. Its style is more that of an attractive essay than of a severe text-book. With these advantages, the name of the author, and the excellent typography, the book cannot fail to command a large circle of readers.

H. K.

VI.—Progressive Medicine. A quarterly digest of advances, discoveries, and improvements in the medical and surgical sciences. Edited by H. A. HARE, M.D., Prof. Therapeutics and Mat. Med., Jefferson Med. Coll., Phila. Vol. I., March, 1899, 479 pages in octavo, contains surgery of the head, neck, and chest. Diseases of children. Pathology. Infectious diseases, including croupous pneumonia. Laryngology and rhinology (by A. LOGAN

TURNER, M.D., Edin.). Otology (by Dr. ROBT. L. RANDOLPH). To the last two chapters, which concern our readers particularly, 90 pages are devoted. The reports are neither systematic nor complete, but constitute abstracts of selected papers, some accompanied by reproductions of the figures of the originals. As far as the abstracts go, they are very good.

H. K.

MISCELLANEOUS NOTES.

ANNOUNCEMENTS.

BRITISH MEDICAL ASSOCIATION, ANNUAL MEETING, PORTSMOUTH, AUGUST 1, 2, 3, 4, 1899.

Section of Laryngology and Otology. President, E. CRESSWELL BABER, M.B. ; Secretary, HERBERT TILLEY, M.D., 101 Harley St., London, W.

Subject of special discussion : "The Diagnosis and Treatment of Chronic Empyema of the Frontal Sinus."

Foreign visitors will be cordially welcomed in the Section, and are requested to send to the Secretary their names and the title of any communication they may wish to make.

SIXTH INTERNATIONAL OTOLOGICAL CONGRESS, LONDON, ENGLAND.

August 7th, 7 P.M.—Reception by the President, Dr. URBAN PRITCHARD.

August 8th to 10th.—Sessions. Subject of special discussion : "Indications for Opening the Mastoid in Chronic Suppurative Otitis Media." Introduced by W. MACEWEN, Glasgow ; H. KNAPP, New York ; LUC, Paris ; A. POLITZER, Vienna.

August 12th.—Excursion with ladies.

Secretary, E. CRESSWELL BABER, Brighton ; Treasurer, A. E. CUMBERBATCH, 40 Portland Place, London, W.

Contribution, \$5, for participation in the proceedings and a copy of the Transactions of the Congress.

An exposition of specimens and instruments will be a feature of the Congress. The English are great collectors, and CHAS. A. BALLANCE, Vice-Chairman, and A. H. CHEATLE, Secretary, 117 Harley Street, W., work hard to make this museum a success. Collections may be deposited at the Examination Hall, Victoria Embankment, until August 5th.

THE VICTORIA EYE AND EAR HOSPITAL, DUBLIN.

At the second annual meeting of the above institution, held on February 14th, it was stated that a site for the new hospital had been approved. The estimate for the new building was £30,000, of which £19,000 had been received.

It was announced that Dr. C. E. FITZGERALD had resigned his position as Surgeon, owing to other demands upon his time.

BEQUESTS.

The late Mr. WILLIAM ROBERTS, of Manchester, bequeathed £1000 to the Old Trafford Deaf and Dumb Schools.

The late Mr. WILLIAM TAYLOR, of Southport, has bequeathed £500 to the St. Paul's Eye and Ear Hospital, Liverpool.

The late Mr. WOOLF JOEL has bequeathed £100 to the Central London Throat, Nose, and Ear Hospital.

APPOINTMENTS.

BENNETT, F. D., M.R.C.S., has been appointed Assistant Anæsthetist to the Royal Ear Hospital, London.

WOAKES, CLAUD, M.R.C.S., has been appointed Surgeon to the London Throat Hospital, Great Portland Street.

LARYNGOLOGICAL SOCIETY OF LONDON.

The following have been elected office-bearers for the ensuing year :

President : F. DE HAVILLAND HALL, M.D.

Vice-Presidents : A. BRONNER, M.D. ; W. R. H. STEWART, F.R.C.S., Ed.

Treasurer : CLIFFORD BEALE, M.D.

Librarian : J. DUNDAS GRANT, M.D.

Secretaries : WM. HILL, M.D. ; LAMBERT LACK, M.D.

Council : EDWARD LAW, M.D. ; WALTER SPENCER, M.S. ; F. W. MILLIGAN, M.D. ; A. BOWLBY, F.R.C.S. ; HERBERT TILLEY, M.D.

CORRECTION.

In my paper entitled "A Plea for a More Accurate Definition of Tuning-Forks," which appeared in the February number of these ARCHIVES, an unfortunate mistake was made in defining the Physicists' C as composed of 512 double vibrations, whereas it should read 512 single vibrations ($C = 512 \text{ v. s.}$).

J. ORNE GREEN.

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